Regional Study on Financing Eco-innovation in South Eastern Europe
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Authors: Dusan Sevic, Raisa Gerasina

Szentendre, Hungary
December 2009

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### Abbreviations

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<tr>
<td>BiH</td>
<td>Bosnia and Herzegovina</td>
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<td>CAD</td>
<td>current account deficit</td>
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<td>CEFTA</td>
<td>Central European Free Trade Agreement</td>
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<td>CDM</td>
<td>Clean Development Mechanism</td>
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<td>CIP</td>
<td>Competitiveness and Innovation Programme</td>
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<td>CNB</td>
<td>Croatian National Bank</td>
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<td>CP</td>
<td>cleaner production</td>
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<td>CPC</td>
<td>cleaner production centre</td>
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<td>EBRD</td>
<td>European Bank for Reconstruction and Development</td>
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<td>EC</td>
<td>European Commission</td>
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<td>EDSM</td>
<td>Energy Development Strategy of Montenegro</td>
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<td>EE</td>
<td>Energy efficiency</td>
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<td>EFFBiH</td>
<td>Environmental Fund of the Federation of Bosnia and Herzegovina</td>
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<td>EFRS</td>
<td>Environmental Fund of Republika Srpska</td>
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<td>EIP</td>
<td>Entrepreneurship and Innovation Programme</td>
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<tr>
<td>EPS</td>
<td>Elektroprivreda Srbije (Serbian National Electricity Company)</td>
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<td>EU</td>
<td>European Union</td>
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<tr>
<td>FAO</td>
<td>Food and Agriculture Organization</td>
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<td>FBiH</td>
<td>Federation of Bosnia and Herzegovina</td>
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<tr>
<td>FDI</td>
<td>foreign direct investment</td>
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<tr>
<td>FEP</td>
<td>Fund for Environmental Protection (Serbia)</td>
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<td>EPEEF</td>
<td>Fund for Environmental Protection and Energy Efficiency (Croatia)</td>
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<tr>
<td>FS</td>
<td>feasibility study</td>
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<tr>
<td>GDI</td>
<td>gross domestic income</td>
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<td>GDP</td>
<td>gross domestic product</td>
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<td>GEF</td>
<td>Global Environment Facility</td>
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<td>GPP</td>
<td>green public procurement</td>
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<td>Ha</td>
<td>hectare</td>
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<tr>
<td>HBOR</td>
<td>Croatian Bank for Reconstruction and Development</td>
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<td>HERA</td>
<td>Croatian Energy Regulatory Agency</td>
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<tr>
<td>IEE</td>
<td>Intelligent Energy-Europe Programme</td>
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<td>IFIs</td>
<td>international financial institutions</td>
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<td>INSTAT</td>
<td>Institute of Statistics of Albania</td>
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<td>IPA</td>
<td>Instrument for Pre-accession Assistance</td>
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<td>IPPC</td>
<td>integrated pollution prevention and control</td>
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<td>IPR</td>
<td>intellectual property rights</td>
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<td>ISO</td>
<td>International Organization for Standardization</td>
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<td>IT</td>
<td>information technologies</td>
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<td>KAP</td>
<td>Podgorica Aluminium Smelter [Kombinat Aluminijuma Podgorica]</td>
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<tr>
<td>NCPC</td>
<td>National Cleaner Production Centre</td>
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<td>NEAP</td>
<td>National Environmental Action Programme</td>
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<tr>
<td>Abbreviation</td>
<td>Full Form</td>
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<tr>
<td>NP EP</td>
<td>National Plan for Environmental Protection</td>
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<td>NS EP</td>
<td>National Strategy for Environmental Protection</td>
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<tr>
<td>OECD</td>
<td>Organisation for Economic Co-operation and Development</td>
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<tr>
<td>PEEREA</td>
<td>Protocol on Energy Efficiency and Related Environmental Aspects</td>
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<td>PEIP</td>
<td>Priority Environmental Investment Programme for South Eastern Europe</td>
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<tr>
<td>PP</td>
<td>pilot plants</td>
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<tr>
<td>PPP1</td>
<td>purchasing power parity</td>
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<td>PPP2</td>
<td>public-private partnership</td>
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<tr>
<td>PV</td>
<td>photovoltaic</td>
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<tr>
<td>R&amp;D</td>
<td>research and development</td>
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<tr>
<td>RDD</td>
<td>research, development and demonstration</td>
</tr>
<tr>
<td>RDI</td>
<td>research, development and innovation</td>
</tr>
<tr>
<td>RDIs</td>
<td>research and development institutes</td>
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<tr>
<td>RE</td>
<td>renewable energy</td>
</tr>
<tr>
<td>RS</td>
<td>Republika Srpska</td>
</tr>
<tr>
<td>RTDI</td>
<td>research, technological development, demonstration and innovation</td>
</tr>
<tr>
<td>S&amp;T</td>
<td>science and technology</td>
</tr>
<tr>
<td>SBDC</td>
<td>Small Business Development Center</td>
</tr>
<tr>
<td>SECO</td>
<td>Swiss State Secretariat for Economic Affairs</td>
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<tr>
<td>SEE</td>
<td>South Eastern Europe</td>
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<tr>
<td>SEEA</td>
<td>Serbian Energy Efficiency Agency</td>
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<tr>
<td>SFRY</td>
<td>Socialist Federal Republic of Yugoslavia</td>
</tr>
<tr>
<td>SME</td>
<td>small and medium-sized enterprise</td>
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<tr>
<td>Toe</td>
<td>tons of oil equivalent</td>
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<td>ToR</td>
<td>terms of reference</td>
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<td>UNDP</td>
<td>United Nations Development Programme</td>
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<tr>
<td>UNECE</td>
<td>United Nations Economic Commission for Europe</td>
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<tr>
<td>UNFCCC</td>
<td>United Nations Framework Convention on Climate Change</td>
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<tr>
<td>UNIDO</td>
<td>United Nations Industrial Development Organisation</td>
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<tr>
<td>USAID</td>
<td>United States Agency for International Development</td>
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We need a new industrial revolution in order to reduce risks related to climate change and achieve a low-emissions and sustainable global economy. It is of utmost importance to improve energy security and develop new technologies that rely less on scarce raw materials. Europe will need to “re-industrialise,” in both its energy and non-energy sectors, and to reshape cities, buildings, transport systems and agriculture. All of these sectors and industries have limits as to how quickly they can develop and deploy new technologies; therefore access to capital and to skilled staff will be critical. If the West Balkan countries want to leapfrog and join the leading countries designing a new low-carbon and resource-efficient economy, they need to introduce new financing schemes to support clean and efficient technologies. Efforts to reduce and mitigate the effects of climate change and to provide for greater energy security will require additional funding, especially from the private sector in the forms of green banking and finance, as well as public-private partnerships.

As stated in the FUNDETEC report: “To meet the financial challenges of tackling climate change and securing an energy-efficient and sustainable economy, public institutions will need the help of commercial type funding on a very large scale. Innovative instruments must tap into private pools of capital, as public resources will prove insufficient to meet the new financing requirements. But these segments cannot act in isolation from each other; much more cooperation between players in public and private finance is required.” The complexity of the current situation in terms of technology, science, finance and public policy requires finding new ways to work together at the regional West Balkans level. Solutions to the gaps and barriers for financing eco-innovation must target participants in each sector for there to be a significant improvement on the current situation.

Another consideration involves the responsibilities of individual investors. Providing products and services that allow individuals to participate in a low-emission and resource-efficient economy is just one part of the challenge. The parallel challenge is to develop ways to encourage individual decisions that share in this effort on a massive scale. The West Balkans eco-innovation/green tech investment platform suggested by the REC should have on its agenda an ambitious banking sector response and should address the different types of banks (public banks such as EIB, and EBRD, saving banks, cooperative banks, international commercial banks, investment banks, retail banks), different types of constraints (listed or not listed banks), as well as different types of responsibilities focused on the main challenges to the acceleration of investments in support of eco-innovation.

Raymond Van Ermen
Executive Director
European Partners for the Environment
Supporting eco-innovation and green industries is one of the prerequisites for restructuring towards a carbon-neutral economy. It is also needed to achieve the goals of the Lisbon Strategy for growth and jobs, and the Gothenburg Strategy for sustainable development. Current levels of support for eco-innovation are not yet sufficient, even in EU countries. Despite the current national and EU programmes for supporting research and development in the domain of eco-technologies, and the readiness of private capital to invest in proven technologies and products, a financing gap remains in the domain of demonstration projects and the pre-commercialisation of such products and technologies. This part of the eco-innovation chain is perceived as too risky for private capital and as too expensive for public funds. Alternative solutions for financing this part do exist, but their application requires more flexible administrative systems and state aid rules, and better cooperation between the private and public sectors.

The countries of South Eastern Europe (SEE) are experiencing much greater challenges, and the eco-innovation financing gap is wider and deeper than in EU countries. Most of the SEE countries are not yet eligible for relevant EU funds for research and development. The state funds are insufficient for investments in basic environmental protection measures, let alone for supporting eco-innovation. Funds from international financial institutions (IFIs) and bilateral donors also remain focused on financing primary environmental infrastructure. In the past several years an increase can be observed in the domain of financing projects for implementing environmental technologies, especially in the domain of sustainable energy. However, this is only the very end of the eco-innovation chain. The main task for SEE countries is to find ways to enhance the effects of scarce available funds, through better strategies, legislation and administrative measures.

This publication attempts to highlight current problems, as well as positive trends and examples that can be replicated throughout the region. The analysis shows that a comprehensive approach is needed, covering financing support to green-tech small and medium-sized enterprises (SMEs) and research institutes on one hand, and sets of stimulating regulations with higher environmental and energy efficiency standards on the other, that will push industry towards using the services of the green-tech sector. I would like to express my gratitude to the Ministry of Housing, Spatial Planning and the Environment of the Netherlands for consistently supporting the projects of the Regional Environmental Center (REC) in the domain of eco-innovation since the Netherlands EU Presidency in 2004. I would also like to thank the numerous contributors to this study — interviewees and participants at the regional conference on financing eco-innovation in SEE, national and international experts, and staff from the REC’s head office and country offices.

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The present study is the final output of the REC project Promoting Financing Mechanisms for Eco-innovation in SEE³. The purpose of this document is to analyse national and regional mechanisms for stimulation and financing eco-innovation in selected countries in the region (Albania, Bosnia and Herzegovina, Croatia, the former Yugoslav Republic of Macedonia, Montenegro and Serbia) and to provide recommendations for improvements.

The spectrum of the innovation process spans from fundamental and applied research, through technology development, pilot and full-scale demonstration projects, product commercialisation and market development, to the introduction of the product or technology to the market and the expansion of production volume. This study addresses the question of how much the companies and institutions in South Eastern Europe (SEE) are ready, willing and able to purchase, install and implement these new technologies and products. In sectoral terms, we have limited our research to the sectors of sustainable energy (energy efficiency and renewable energies), recycling and cleaner production. A background study (REC 2009) showed that the scarce support to eco-innovation in the SEE countries is very much focused on the sector of sustainable energy.

Assistance to eco-innovation is below the needed level for achieving sustainable, low-carbon economies even in EU member states (EC 2004; EPE 2008). The main gap in financing eco-innovation is located at the middle of the eco-innovation spectrum in the technology development and demonstration phase. In the studied SEE countries this gap is deeper and wider, and it encompasses all stages of eco-innovation.

The reasons for this situation are complex. Firstly, the comparatively low level of economic development of the region reduces the possibilities for both public and private financing of green technology implementation in existing industry, public institutions and building stock, let alone investing in green technology research, development and demonstration (RDD) projects. International financing mechanisms are not fully adapted to the conditions in the beneficiary countries, and most of the potential recipients in these countries are not familiar with the conditions and application procedures. The lack of state funds and relevant credit lines (with conditions adapted to local SMEs) from IFIs could be partially circumvented by the introduction of innovative funding schemes such as debt loans, subsidies, tax and customs relief, green taxes, green savings schemes, investment guarantee funds, revolving green investment funds, and public-private cooperation support schemes.

Secondly, the examined countries are still in the process of creating or updating relevant strategies and harmonising legislation. In an effort to create new strategies and legislation that comply with EU directives (in some cases hampered by lengthy administrative or political processes), the new documents are designed based on the general provisions of EU directives, and not enough time is given to consider good and bad examples from the EU member states’ national legislation and practices. In most of the countries, the relevant strategies are inadequate or missing, or they lack implementation plans and/or specifically allocated funds to support the implementation of these plans. The secondary legislation is largely missing, except in Croatia. During the past year, Montenegro and Serbia have made significant progress in adopting the necessary secondary legislation, especially in the domain of sustainable energy.

Finally, the institutions that would be key to supporting eco-innovation are either not created yet, or have very limited experience in the new topics and tasks that they are facing. Many of these new institutions are entirely dependent on the (time-limited) projects implemented by IFIs or donor organisations. As a result, the support from these institutions is in most cases weak and intermittent.

On the other hand, we observed a real interest on the part of companies (especially SMEs) and research institutions for RDD and the actual application of green technologies. This interest is based not so much on environmental concerns, as on the high potential for economic gains from such activities. Therefore, there is a genuine interest from the private sector in implementing and developing green technologies. Good examples from the
studied countries that support this point are available in Chapter 4. However, the problems outlined above prevent these companies and research institutes from securing their own funds or attracting external investments.

As mentioned above, Croatia and Serbia have forms of state support for eco-innovation and green industries. In Croatia almost the entire eco-innovation spectrum is covered, while in Serbia this is true only for the R&D part of the spectrum. Bilateral donors and IFIs currently cover only the application of eco-technologies. In a sense, donors and IFIs also cover demonstration projects, but this is linked to existing (foreign) technologies, and not to the promotion of emerging (domestic) ones. Some EU programmes do cover RDD projects, but this possibility is substantially effectuated only in Croatia at present.

Encouraging signs we observed in the examined countries are the positive trends in GDP and foreign direct investments (FDI) in the region; the enhanced efforts of all countries in updating strategies and legislation (especially starting from 2008), which showed direct positive effect (particularly in the sustainable energy sector); and quick actions from the private sector side upon each relevant legislation update.

The country where we observed the fastest growth of eco-industries and eco-innovation activities, Croatia, is not only the country with highest GDP and FDI, but also where the most comprehensive institutional and legislative changes have been made. A specific point about legislation is that not only legislation in relevant sectors (energy, recycling and cleaner production) was adequately updated, but equally important were the changes in the legislation regulating state aid (especially for SMEs) and support for scientific research and development. This second component is largely missing in the other studied countries.

Another key factor in the advantages observed in Croatia is the fact that state institutions (partly) responsible for supporting eco-industries and eco-innovation are financing institutions, with funding programmes directed specifically at sustainable energy, environmental protection and waste management (including recycling). The Environmental Protection and Energy Efficiency Fund (EPEEF) is largely channelling funds from the state budget and IPA, while the Croatian Bank for Reconstruction and Development (HBOR) is channelling, mainly from IFIs, several credit lines specifically addressing technological aspects of environmental protection and sustainable energy. Other agencies and ministry units that do not operate with such large funds use supplementary methods such as subsidies, tax and customs reliefs. An additional positive factor is the selection of personnel with the relevant technical and financial background, able to provide solid technical assistance to beneficiaries in project preparation and funding applications.

Other countries in the region would benefit from applying similar principles. In that context, we would recommend the establishment of a regional West Balkans eco-innovation/green-tech investment platform with the aim of exchanging experiences with financing eco-innovation within the region by means of a web portal and a series of sector-focused national and regional meetings, as well as workshops led by eco-technology support fund managers and representatives from successful eco-industries from EU countries.
The project Promoting Financing Mechanisms for Eco-innovation in SEE3 aimed to identify existing and potential mechanisms for stimulating and financing eco-innovation in the selected countries in the region (Albania, Bosnia and Herzegovina, Croatia, the former Yugoslav Republic of Macedonia, Montenegro and Serbia). The objectives of the project were to identify conditions for, and barriers to, the efficient financing of eco-innovation in SEE countries; propose solutions for overcoming these barriers; and organise a conference for exchanging experiences and ideas in order to further promote eco-innovation financing in the region.

The specific objectives of this project were to identify existing and upcoming legal, institutional and financial mechanisms that could be used for promoting and financing eco-innovative projects and companies in the region in the upcoming years; identify legal, institutional and financial barriers that should be overcome in order to achieve a stimulating environment for financing eco-innovation; launch a regional debate, with multi-stakeholder involvement, on supporting and implementing eco-innovative projects and companies; and propose possible solutions for overcoming existing barriers in SEE countries.

In sectoral terms, this project was focused on sustainable energy (energy efficiency and renewable energy), recycling and cleaner production. In terms of the eco-innovation process, the project team decided to encompass not only research and development, pilot/demonstration projects, and the full commercialisation of new eco-technologies, but also the issue of acquiring and implementing such technologies and products in enterprises in the studied countries.

During 2008, a desk study and a survey were conducted by the REC project team. The desk study included a macro-economic overview of the examined countries, as well as an overview of existing strategies, policies and plans, legislation and relevant institutions and contacts. Based on the results, a questionnaire was designed and sent out to the following contacts: officials from the ministries of environment, finance, economy and regional development, and relevant sectoral ministries; chambers of commerce; representatives of environmental technology and eco-innovative SMEs; representatives of large enterprises and SMEs from relevant sectors as well as their associations; representatives of private, national and multinational investment and development banks; universities and research institutes; and environmental NGOs oriented towards eco-innovation issues. Based on the results of the questionnaires, key stakeholders were selected for further interviews during 2008 and 2009.

Based on the results of the questionnaires and interviews, a background study was completed in February 2009 (REC 2009), and a discussion paper (REC 2009a) was prepared for the conference Financing Eco-innovation in SEE, which took place in Zagreb on April 27, 2009. The goal of the conference was to initialise regional discussion and to propose solutions for improving national and regional mechanisms for financing and promoting eco-innovation in the region. The conference addressed sustainable energy, recycling and cleaner production, with a focus on sustainable energy, which was identified during the survey as the most actively financed sub-sector. The discussion addressed such key issues as the mobilisation of private and public funding, bridging the gap between early-stage innovation and commercialisation, creating fiscal incentives, fostering public-private partnership instruments, and enhancing cooperation between relevant agencies.

Speakers at the conference included representatives of EU and member states’ programmes for supporting eco-innovation; representatives of relevant regional IFI programmes; representatives of national institutions and financing mechanisms; as well as researchers and businesses. Presentations and discussions took into consideration existing mechanisms for financing eco-innovation in the EU and SEE, and ways to improve these mechanisms. Among the conclusions of the conference, a strong need was identified for creating active national multi-stakeholder platforms in SEE countries to promote eco-innovations, overcome existing barriers, and catalyse the relevant financing mechanisms.

The present regional study combines the findings...
from the survey, the discussion paper and the conference discussions and conclusions. It also provides updated country profiles in Chapter 1, and international funding mechanisms applicable for the region in Chapter 2. In Chapter 3, the key challenges and barriers identified in countries and regional mechanisms are presented, Chapter 4 contains examples of good practice, and Chapter 5 provides conclusions and recommendations for all countries in the region, based on identified challenges, barriers and good examples.
The process of economic transition to market-based economies essentially started after 2000 because of the wars in the mid-1990s and/or the political situation in the studied countries. The process of transition was delayed by at least 10 years, which has resulted in the current lower competitiveness and foreign investment flows compared to Central Europe. However, macro-economic data since 2004 have shown sustainable economic growth and a growth in foreign direct investments.

Strong economic growth was sustained at between 4 and 8 percent between 2004 and 2008. The major factors contributing to sustainable economic development in the past five years were the dynamic development of the private sector, price liberalisation, the restructuring and privatisation of key industrial enterprises, the modernisation of the financial sector, increased revenues and a robust growth in exports.

Additional factors facilitating stable economic growth were the improvement in the transparency and accountability of public services, the creation of institutions for the regulation and supervision of the market economy, and the adoption of necessary legislation. In all of the countries, inflation rates have been kept low and currencies have remained stable in recent years due to national governments’ cautious monetary and fiscal consolidation policies (EC, Economic and Financial Affairs website).

The region’s mid-term macro-economic outlook remains favourable, subject to the maintenance of internal and regional stability, the continuation of structural reforms, reforms in the business and labour sectors, market liberalisation, infrastructural restructuring, and the privatisation of strategic enterprises (EBRD 2009).

Levels of economic development and foreign direct in-
vestment are important factors and, at the same time, indicators that determine the countries’ abilities to support research and development, and the readiness of domestic and foreign private capital to invest into full commercialisation and actual application of eco-technologies. Assuming the continuation of the positive economic trends (together with the positive strategic, legislative and administrative changes discussed in the following sections), state public and private domestic and foreign investments in eco-innovation are expected to rise in the forthcoming period.

Albania

Albania is characterised by its small size in terms of population and income. In addition, the structure of the economy is still determined by a high share of agricultural employment and rural population, limited exports and foreign direct investment (FDI). Lagging behind other Balkan countries, Albania is in a state of long-term transition to an open market-based economy. The government is continuously taking measures to reduce the large share of grey economy. The country’s economy is constantly bolstered by annual remittances of USD 600-800 million, coming from Albanians living abroad, mostly in Italy and Greece, which help offset the towering trade deficit.

Energy shortages and outdated and inadequate infrastructure are also limiting the development of Albania’s business environment and make it difficult to attract and sustain an adequate level of foreign investments. The government is moving slowly in the direction of improving the poor national transport networks, seen as a long-standing barrier to constant economic growth (Central Intelligence Agency, 2008).

The Albanian economy recovered rapidly from the 1997 financial crisis and displayed a stable growth performance, demonstrating a 5.8 percent medium annual growth from 2004 to 2008. Buoyant domestic demand galvanised by growing domestic credits, substantial migrant remittances from abroad and the expansion of non-tradable sectors have contributed to the increase of growth and the offset of a growing trade deficit. Dynamic private sector development, the liberalisation of the economy, the restructuring of key industrial sectors, the redistribution of major production factors and revenues, along with an opened trade regime have facilitated the further growth of productivity (EC, 2009). Albania has also experienced a dynamic sectoral development accompanied by the redistribution of revenues over the last few years. Services and agriculture are two key GDP production sectors, while the construction sector plays an important role in GDP annual rate growth (Albinvest, 2008). Although foreign direct investment is constantly increasing, reflecting inflows in the financial, construction and manufacturing sectors, it is still low compared to regional standards.

The country’s mid-term economic overview looks favourable. Increasing electricity and agricultural pro-
duction is projected to offset a decline in output from the mining and industrial sectors. Sustaining the current level of GDP growth depends on further continuation of reforms in the business sector and infrastructure restructuring projects, which will allow Albania to attract more foreign investors and expand export markets. Reducing the booming credit growth is an additional challenge due to large-scale property restitutions and compensation processes (EBRD 2009).

After the completion of the structural reform integrating institutes of the Academy into universities, research is mainly undertaken in universities and ministerial research institutes. Although there are no systematic research and development (R&D) and innovation statistics, estimates regarding public expenses are close to 0.18 percent of GDP, which is about EUR 15 million. This is almost exclusively funded by the public sector and foreign sources. Human resources for research include about 240 researchers and 350 professors, who dedicate more of their time to teaching than research. The distribution of researchers by scientific discipline shows that almost 40 percent of researchers in Albania are in the domain of natural and technical sciences, 14 percent in medical sciences and around 8 percent in agricultural sciences. A considerable brain drain in the last decades has deprived the national economy of more researchers and scientists.

The main governmental body responsible for R&D activities and the general administration of Albanian national science and technology (S&T) programmes is the Ministry of Education and Science (MoES). The financing of R&D activity is conducted through institutional funding by the government, programme financing through the MoES, programme financing in the framework of bilateral programmes, and international collaboration. The latter has been introduced recently, largely financed by small foreign donors, and may still be regarded as a pilot. While there have been visible efforts to concentrate resources and introduce competitive criteria, a research and innovation policy has not yet been devised.

According to an October 2008 EU report, Albania has made slight progress in the area of policies for implementing the European Charter for Small Enterprises. In a self-assessment exercise, carried out using the SME Policy Index, an analytical tool designed by the Organisation for Economic Co-operation and Development (OECD) to measure the 10 policy dimensions of the charter, Albania scored 2 out of a maximum of 5. This compares with the lowest levels of the Western Balkans. The weakest dimension was education and training for entrepreneurship. Another weak dimension was strengthening the technological capacity of small enterprises.

Relevant strategies, plans and legislation


In June 2009, the Council of Ministers approved the National Strategy for Science, Technology and Innovation (STI) in Albania covering the period 2009-2015. The document was coordinated by the Department of Strategy and Donor Coordination of the Prime Minister’s Cabinet, in cooperation with the Ministry of Education and Science and with UNESCO assistance.

The small share of R&D in the higher education sec-

### TABLE 1: Macro-economic indicators for Albania

<table>
<thead>
<tr>
<th>Year</th>
<th>GDP (in billion USD)</th>
<th>GDP growth (%)</th>
<th>GDP per capita (in USD)</th>
<th>GDP per capita (PPP) (in USD)</th>
<th>Inflation (%)</th>
<th>Unemployment (%)</th>
<th>Exports (% of GDP)</th>
<th>Imports (% of GDP)</th>
<th>Current account balance</th>
<th>Budget deficit</th>
<th>Foreign direct investments (% of GDP)</th>
</tr>
</thead>
<tbody>
<tr>
<td>2004</td>
<td>7.5</td>
<td>7.0</td>
<td>2,389</td>
<td>4,500</td>
<td>2.4</td>
<td>15.8</td>
<td>21.5</td>
<td>43.2</td>
<td>-3.9</td>
<td>-4.9</td>
<td>3.9</td>
</tr>
<tr>
<td>2005</td>
<td>8.4</td>
<td>5.6</td>
<td>2,672</td>
<td>4,900</td>
<td>3.2</td>
<td>14.8</td>
<td>22.2</td>
<td>46.2</td>
<td>-6.5</td>
<td>-3.6</td>
<td>3.4</td>
</tr>
<tr>
<td>2006</td>
<td>9.1</td>
<td>5.5</td>
<td>2,903</td>
<td>5,300</td>
<td>2.4</td>
<td>14.3</td>
<td>23.6</td>
<td>47</td>
<td>-5.9</td>
<td>-3.1</td>
<td>3.3</td>
</tr>
<tr>
<td>2007</td>
<td>10.6</td>
<td>6</td>
<td>3,401</td>
<td>6,300</td>
<td>3.1</td>
<td>13.0</td>
<td>16.6</td>
<td>37.7</td>
<td>-10.5</td>
<td>-3.4</td>
<td>5.8</td>
</tr>
<tr>
<td>2008</td>
<td>13.5</td>
<td>5.8</td>
<td>4,247</td>
<td>6,797</td>
<td>3.9</td>
<td>13.0</td>
<td>10.4</td>
<td>35.9</td>
<td>-9.2</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**Source:** Compiled by the REC from IMF, Bank of Albania, INSTAT, NCB, WIIW, 2009.
tor is mainly due to the lack of direct financing and human capital available today. It is unlikely that the private sector will begin to invest in formal R&D in a major way, but one of the goals of the strategy is to develop structured product development and innovation activities in a limited number of firms. An action plan detailing the operational aspects complements the strategy. The strategy should be implemented in conjunction with other sectoral strategies and taking into account Albania’s Higher Education Strategy, adopted in 2008, and the National Strategy for Development and Integration (2007-2013), which also emphasises the strategic importance of energy, environmental and water resource management.

In summary, the strategic goals of the STI strategy are:

1. to triple public spending on R&D to 0.6 percent of GDP;
2. to augment the share of gross domestic expenditure on R&D from foreign sources, including via the European Union’s Framework Programmes for Research, to the point where it covers 40 percent of research spending;
3. to create four or five Albanian centres of excellence in science which will be equipped with dedicated laboratory equipment and workspaces that could be used for pre-incubation, testing, certification and so on of new technology-based firms;
4. to double the number of researchers, both through “brain gain” incentives like a returning researchers grant scheme and through the training of new researchers, including 500 PhDs, which will entail establishing up to three new doctoral programmes in Albanian universities; and
5. to stimulate innovation in 100 companies, either via investment in local R&D or via consortia with academic research institutes or foreign partners.

**Business and Investment Development Strategy 2007-2013**

The Business and Investment Development Strategy pays special attention to the strengthening of Albanian businesses, for example increasing the technological capacities of SMEs. Investments in 2007 and 2008 grew significantly, mainly in industrial machinery and equipment (including equipment for renewable energy production and energy efficiency measures in industry) as well as information technologies (IT). According to the Institute of Statistics of Albania (INSTAT), investments in machinery and equipment for 2007 increased by about 57 percent compared to 2006. The strategy dedicates special attention to programmes increasing SME competitiveness, and to the drafting of a strategic programme and action plans regarding technology transfer and innovation. It also envisions:

- boosting the competitiveness of SMEs through the application of the Programme on Competitiveness Fund;
- drafting a strategic programme and action plans on technology transfer and innovation using the Instrument for Pre-accession Assistance (IPA); and
- the participation of Albania in the EC Competitiveness and Innovation Programme (CIP), for the period 2007-2013.

The strategy stresses the importance of good coordination between SMEs, export and FDI promotion policies; and of establishing partnerships between FDI and SMEs in the value chain. It includes specific measures for technology transfer and innovation, research and development, and partnership with universities and academic resources.

The measures in the Business and Investment Development Strategy that are indirectly relevant for supporting eco-innovation are:

- establishing and improving management and training skills;
- promoting creative enterprises; and
- increasing competitiveness through technology transfer and innovation.

Plans to implement the first measure involve encouraging universities to provide specialised courses on entrepreneurship in such areas as e-business and innovation technologies. The second measure will be implemented through studies and development programmes for specific sectors.

The third measure listed above should be carried out through:

- the development of a technology transfer and innovation strategy;
- the development and implementation of training programmes on SME competitiveness and internationalisation potential;
- improved infrastructure for supporting export promotion institutions;
- the preparation of a programme for the establishment of a pilot R&D centre at Tirana University;
- a programme for developing Albanian brand products and a pilot model;
• support for the creation of innovative SMEs as an employment source;
• a partnership programme for the establishment of innovation centres;
• support for SMEs in priority economic (manufacturing) sectors;
• support for SMEs to enable them to become acquainted with and implement ISO and EC standard systems;
• the establishment of a technology transfer and innovation promotion fund (in order to improve and transfer contemporary technology and, given the high cost of credit in the country, to support schemes for technology transfer and innovation);
• an e-commerce development programme;
• the preparation of the legal framework on e-commerce and electronic signature;
• the establishment of industrial zones;
• SME monitoring, with annual and periodic SME performance analysis, studies and publications; and
• the establishment of the Euroinfo Correspondence Centre.

The estimated cost of implementing the Albanian Business and Investment Development Strategy is LEK 4,660 million (EUR 33.9 million). It is assumed that part of these funds will be supported by the EC (IPA and CIP).

SME Development Strategic Programme 2007-2009

The SME Development Strategic Programme envisions the accelerated improvement of the business and investment environment; the increased competitiveness of SMEs in regional and global markets through the development of technology and information; the reduction of administrative barriers; and the provision of facilities for businesses such as business incubators and technology clusters. Currently there are only two business incubators in place, one in Tirana and one in Shkodra, but neither of them has yet justified its real role as a generator of new businesses and employment. In the SME Development Strategic Programme 2007-2009, support for the establishment of business technology incubators was foreseen. During 2008, the government approved seven economic zones with the status of industrial parks:

1. in Koplik, Shkodra, with a surface area of 61 hectares (ha) (state property): the concession contract has been signed and is expected to be approved by the Council of Ministers;
2. in Shengjin, Lezha, with a surface area of 3.2 ha (state property): the concession contract has been signed;
3. in Elbasan, with a surface area of 254.7 ha (state and private property);
4. in Spitalle, Durres, with a surface area of 850 ha (state and private property);
5. in Vlore, with a surface area of 125 ha (state property): the concession contract has been approved and signed by the Ministry of Economy, Trade and Energy (METE) and the organisation Idea Vlora;
6. in Shkodra, with a surface area of 130 ha (state and private property); and
7. in Lezha with a surface area of 54 ha (state and private property): Lezha municipality is the contracting authority.


This strategy envisions the further development of economic instruments for environmental protection such as charges, fines or taxes, and subsidies, and the creation of an environmental fund “that will be financed by environmental taxes and fines, as well as by donations. The Environment Fund will serve to finance projects for environmental protection and technological innovations that improve the environment.” However, the fund has not yet been established.

National Strategy for Development and Integration

The National Strategy for Development and Integration is important for eco-innovation support in relation to energy efficiency and renewable energy. One of its aims is to increase the use of renewable energy sources by preparing a special law on renewable energy, based on EU Directive 2001/77, which will define clearly the authorisation procedures for constructing facilities. It will also attract foreign investors, particularly for wind farms, for which there is a great deal of interest. Other objectives include improving the sub-legal and regulatory framework to promote the use of solar panels, especially for the heating of water for residential and industrial purposes; improving and completing the entire legal and regulatory framework in the context of the new Law on Concessions, which opens up major opportunities to attract pri-
vate investment for the construction of small hydroelectric power stations; and, by approving the Law on the Production, Transporting and Trading of Biofuels and Other Renewable Fuels for Transport.

The strategy also aims to encourage the efficient use of energy “both in the exploitation of energy sources and the reduction of electricity consumption” by developing efficiency programmes for various sectors; strengthening the legal framework for the efficient use of energy; and improving the implementation of the Law on Energy Efficiency. Other measures include reducing energy consumption in the residential sector through changes in the tariff structure and by promoting the use of efficient lightbulbs, thermal insulation and other measures; promoting the use of modern technologies in the industrial, service and agricultural sectors for efficient energy supply; and promoting better management and higher efficiency in the transport sector. The strategy also envisages the establishment of a competitiveness fund as a public service for innovation and technology transfer, and the encouragement of producer associations.

National Strategy for Energy
The National Strategy for Energy contains three energy efficiency and renewable energy specific objectives:

- to establish an efficient energy sector in regards to financial and technical aspects;
- to establish an effective institutional and regulatory framework and restructuring energy companies; and
- to increase energy efficiency in the generation/production and final use of energy sources with the aim of minimising environmental pollution.

The strategy compares two scenarios: passive and active. The active scenario envisages a quantitative description of the measures needed to increase energy efficiency and to introduce alternative sources in the energy system in order to “transform the energy system into a supporting sector for the development of the Albanian economy and an increase in the general standard of living.” The strategy includes an action plan that envisions reducing energy demand through support for energy efficiency and renewable energy through specific measures with implications for eco-innovation. These measures include: thermal insulation of the existing stock of public buildings and based on a new code for new buildings; the promotion of solar energy use to provide hot water in the household and service sectors; the promotion of efficient lighting in households and the service and industrial sectors; increased energy efficiency in existing boilers/furnaces in the industrial and service sectors; and other eco-innovation-related measures.

Law on Environmental Protection
The Law on Environmental Protection includes a set of environment-friendly fiscal incentives for economic operators and individuals, in compliance with the principles of the free market, in order to promote investments in clean technology, energy conservation, and the efficient use of natural resources. Article 87 on environmental funds envisions financial support to scientific research, the drafting of studies and the training of specialists. Article 20 on waste management envisions the recycling, reuse and regeneration of waste in other processes.

Law on Energy Efficiency
The Law on Energy Efficiency creates the legal framework required for promoting the efficient use of energy and minimising negative environmental impacts. It envisions establishing an energy efficiency fund administered by the National Energy Agency. The law also envisions the creation and implementation of energy efficiency and renewable energy programmes prepared by the National Energy Agency.

Institutions and stakeholders
Ministry of Economy, Trade and Energy
The Ministry of Economy, Trade and Energy (METE) drafts and implements policies that promote economic growth and stability in order to enable local business development and attract foreign investment. It also promotes competition and a regulated market, with the goal of ensuring the sustainable development of the country’s energy resources, and fair conditions for SMEs. The METE has designed and is now implementing the Business and Investment Development Strategy 2007-2009, which includes measures for technology transfer, competitiveness and innovation, as discussed above.

Ministry of Environment, Forestry and Water Administration
The Ministry of Environment, Forests and Water Administration (MoEFWA) is responsible for the implementation of water policy and forestry policy. The mission of the MoEFWA is to draft and propose policies, strategies and action plans for the protection and administration of the environment, forests, waters and fisheries in order to achieve sustainable development; to improve quality of life; and enable the country to join the EU. This mission is accomplished through the participation, initi-
ation and coordination of activities that lead to long-term developments and well being by protecting nature and raising public awareness. The MoEFWA’s main tasks include: implementing relevant national policies; defining priority environmental and forestry investments; coordinating the environmental protection-related activities of other ministries and local authorities; and developing national research programmes in the environmental field.

Ministry of Education and Science

The Ministry of Education and Science (MoES) is responsible for the development and improvement of the education system in Albania through changes in the legislation and through the improvement of the teaching infrastructure. It is also responsible for designing a strategy for science and technology development; for the functioning, administration and development of scientific research, based on the Law on Science and Technological Development; and for the adaptation of the education system to the necessary internal or global changes. The ministry is responsible for the preparation of scientific and technological policy; related national research and development programmes; the development and improvement of the scientific and technological system from the institutional, financial and legislative perspective; and of the management of national programmes for scientific and technological development.

Bosnia and Herzegovina

The reconstruction phase in Bosnia and Herzegovina (BiH) was boosted after 2000 by large inflows of aid accompanied by strong economic growth sustained at an average of 5.5 percent between 2002 and 2008 driven by private sector investments and by the growth of the financial and construction sectors and exports (EC, 2009). The country’s GDP has quadrupled in recent years and merchandise exports have achieved 20 percent growth on average. Based on per capita GDP, estimated at about USD 4,900 for 2008, BiH is classified as a lower middle-income economy. The performance of the industrial sector was also positive, especially in the mineral and mining sector and in the energy sector in Republika Srpska (RS), reflecting new investments associated with the restructuring and privatisation processes (EBRD 2009).

Political efforts initially devoted to reconstruction have shifted in the direction of structural reform combined with institution building. Privatisation is proceeding at a slow pace, with more progress being achieved in RS than in the Federation of Bosnia and Herzegovina (FBiH). The government sector is still the largest among the Balkan countries and accounts for approximately 45 percent of GDP (EC, 2009).

Financial sector reforms are well advanced, with the banking sector mostly modernised and privatised. Other state-owned companies are being privatised at a slower speed and the contribution of the private sector to GDP is still lower than in other countries in the region. Although early privatisation led to diluted ownership and loss of control, some privatised companies managed to become major contributors to sectoral growth. The government achieved a large degree of trade liberalisation and the country’s inclusion into the regional free trade network (WB, 2009).

Export growth started slowly in 2004 and has become remarkable in recent years, predominantly steel, aluminium and increasing shares of technologically sophisticated products (machinery, car parts and furniture), significantly surpassing that of the rest of the Balkan region. Exporters are in the process of finding new markets and seek to continue the strong export growth pattern of the last few years. The share of imports has also increased from a low 38 percent in 2000 to around 70 percent in 2008 (WB 2009).

The macro-economic outlook for BiH remains favourable depending on the maintenance of internal and regional stability. Nonetheless, the country still suffers from many flaws in the system such as an inefficient public sector, an overregulated business sector and a segmented labour market demonstrating the institutional and ethnic fragmentation of the country (EBRD, 2009).

Due to the existence of two main entities (FBiH and RS), Bosnia and Herzegovina (BiH) lacks a legislative and political basis for efficient decision making and for the delegation of responsibility in the environment and energy sectors, which is even more acute in the sectors of renewable energy and energy efficiency. Certain action plans on federal and entity levels for the energy sector have already been adopted, however their implementation is very slow. Efforts will have to be made to improve policy coordination between entities and to create a unified economic space.

Further structural reforms are urgently required, including the privatisation of strategic enterprises, faster business registration, an improved inspection system, improved corporate governance practices and the more effective implementation of bankruptcy laws, an improved business environment, and the reform of the labour market in order to provide better support for the private sector (EC, 2009).
Relevant strategies, plans and legislation

Bosnia and Herzegovina, with its two main entities, has strategies in place at the national level, while laws are developed and applied at the entity level.

National Environmental Action Plan

The National Environmental Action Plan envisages the establishment of sustainable development funds for financing projects; providing administrative support for the sustainable management of cleaner production enterprises; and increasing energy efficiency by technological restructuring, the better use of energy sources and the increased use of renewable energy (hydro, solar, wind and geothermal energy). It also envisages the preparation of a strategy for the development of an energy sector that would provide for the balanced consumption of domestic (hydro, thermal and geothermal) and potential foreign (oil and gas) energy resources while introducing the use of new energy sources (geothermal, wind, solar etc.) with the intention of maximising the utilisation of domestic renewable resources.

Energy Strategy of RS Terms of Reference

As defined in the section on financing within the Terms of Reference (ToR) for the Energy Strategy of RS, the Energy Strategy should provide estimates of financial resources for the implementation of activities aimed at, among other things:

- increased energy efficiency on all levels;
- the production of electricity from cogeneration;
- the use of renewable energy sources; and
- increased energy efficiency in residential construction, industry, transport, multi-purpose buildings etc.

The Energy Strategy should also elaborate the tax and customs incentives for renewable energy sources and energy efficiency in order to fulfil environmental protection demands. Financing should be applied to necessary investments in network grids, island-isolated systems and small producers, state and local community activities, as well as investments in entrepreneurs and citizens themselves.

Strategic Plan and Programme for the Development of the Energy Sector in FBiH

One of the priorities of this plan is the rational use of energy and energy efficiency. The special priority is the use of renewable energy sources such as wind, biomass, geothermal, solar and the potential of hydro energy, especially on small rivers. The "Operative Measures" section mentions the necessity for the development and adaptation of the legal framework for renewable sources.

Draft Environmental Protection Strategy of FBiH

The Draft Environmental Protection Strategy proposes the improvement of financing instruments for a set of environmental protection measures, including the following measures relevant to eco-innovation:

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**TABLE 2: Macro-economic indicators for Bosnia and Herzegovina**

<table>
<thead>
<tr>
<th>Indicator</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP (in billion USD)</td>
<td>10.0</td>
<td>10.8</td>
<td>12.3</td>
<td>13.2</td>
<td>14.2</td>
</tr>
<tr>
<td>GDP growth (%)</td>
<td>6.3</td>
<td>4.3</td>
<td>6.3</td>
<td>6.8</td>
<td>5.5</td>
</tr>
<tr>
<td>GDP per capita (in USD)</td>
<td>2,581</td>
<td>2,751</td>
<td>3,107</td>
<td>3,809</td>
<td>4,848</td>
</tr>
<tr>
<td>GDP per capita, PPP (in USD)</td>
<td>5,497</td>
<td>5,942</td>
<td>6,501</td>
<td>7,074</td>
<td>7,618</td>
</tr>
<tr>
<td>Inflation (%)</td>
<td>0.6</td>
<td>4.3</td>
<td>4.6</td>
<td>4.9</td>
<td>8.0</td>
</tr>
<tr>
<td>Unemployment (%)</td>
<td>43.1</td>
<td>44.7</td>
<td>48.0</td>
<td>44.0</td>
<td>42.5</td>
</tr>
<tr>
<td>Exports (% of GDP)</td>
<td>29.4</td>
<td>32.6</td>
<td>36.8</td>
<td>36.8</td>
<td>31.2</td>
</tr>
<tr>
<td>Imports (% of GDP)</td>
<td>70.7</td>
<td>74.7</td>
<td>66.5</td>
<td>69.3</td>
<td>70.6</td>
</tr>
<tr>
<td>Current account balance (% of GDP)</td>
<td>-16.4</td>
<td>-17.8</td>
<td>-8.5</td>
<td>-13.2</td>
<td>-17.2</td>
</tr>
<tr>
<td>Budget surplus/deficit (% of GDP)</td>
<td>1.7</td>
<td>2.6</td>
<td>2</td>
<td>0.7</td>
<td>0.7</td>
</tr>
<tr>
<td>Foreign direct investment (% of GDP)</td>
<td>3.1</td>
<td>4.9</td>
<td>3.7</td>
<td>10.9</td>
<td>10.6</td>
</tr>
</tbody>
</table>

• improving eco-efficiency; and
• stimulating technical innovation related to environmental protection and pollution reduction.

One of the main goals of the strategy is to stimulate the use of renewable energy sources. This goal is envisaged to be attained through the following measures:

• policy development for providing incentives for the production and use of renewable energy through voluntary mechanisms;
• the establishment of a Clean Development Mechanism (CDM) office and system for CDM use;
• the development of policies that encourage the production and use of renewable energy sources and enable international support (through CDM flexible mechanisms and the CDM office); and
• the promotion of renewable energy resources to decrease dependence on energy imports.

Relevant environmental protection laws in RS
Apart from the Law on Environmental Protection, the entity has adopted the following legislation: the Law on the Fund for Environmental Protection, the Law on Waste Management, the Law on the Protection of Air, and the Law on the Protection of Nature. Each of these laws contains financial mechanisms for environmental and environmental technology development projects.

The Law on the Fund for Environmental Protection defines the fund’s duties in collecting and distributing funds for environmental protection in RS. Its aim is to:

• support measures that protect the environment, especially in the area of development and financing information systems, education and information dissemination, research and public activities related to environmental protection; and
• preserve protected areas, improve public awareness of environmental issues and encourage research related to environmental protection.

The Law on Waste Management provides measures for waste minimisation, processing, reuse, recycling, and safe disposal. The law also stipulates the following eco-innovation and eco-technology measures:

• the employment of technologies that minimise the use of raw materials and energy;
• the reuse of materials to the maximum possible extent;
• production with minimum waste generation and minimum harmful effects; and
• the reuse, recycling and replacement of raw materials with “waste” to the maximum extent possible.

Relevant environmental protection laws in FBiH
The Law on the Environmental Protection Fund of FBiH defines the main objectives and activities of the fund, including the collection and distribution of monies for environmental protection. Fund activities include financing the preparation, implementation and development of programme documents, the improvement of environmental conditions and the use of renewable energy sources.

The FBiH Law on Waste Management has the goal of encouraging and ensuring the conditions for waste minimisation, reuse and recycling, the separation of raw materials and their subsequent use in energy production, and safe waste disposal. The law encourages the reuse of waste, especially as an energy source when possible. Producers should use energy-efficient technologies that generate minimum waste.

Institutions and stakeholders
Ministry of Economy, Energy and Development of RS
The Ministry of Economy, Energy and Development is responsible for industry, energy and mining in relation to the production, transfer and distribution of electricity; engineering; the production of electrical machines and appliances; the production and processing of paper; the collection and primary processing of industrial waste; and the preparation of a development strategy for SMEs.

Ministry of Science and Technology of RS
The roles and responsibilities of the Ministry of Science and Technology of RS are related to scientific research; the strategy for the technological development of RS; the stimulation of applied research; and the development of domestic investment technologies and human resources in scientific research, innovation, and the development and enhancement of technology. The ministry has produced the Regulation on Procedures and Criteria for Financial Support to Innovations in Republika Srpska. This regulation allows investments and financial support to innovations of up to KM 37,650 (around EUR 19,000), which is far from sufficient.
Ministry for Environment and Tourism of FBiH

The Federation of Bosnia and Herzegovina has its own constitution, which is different from that of RS. In addition, FBiH is divided into 10 cantons, each of which has its own ministries and responsibilities, including the ministry responsible for environmental issues. According to the constitution of FBiH, the environment is the shared responsibility of the federal and cantonal governments.

Ministry of Education and Science of FBiH

The FBiH Ministry of Education and Science performs administrative, professional and other tasks as laid down by the legislation related to the competencies of the Federation of Bosnia and Herzegovina in the areas of the development of scientific activity; the protection of copyrights and intellectual property; the coordination of scientific research activities; the development of scientific research institutions; the encouragement of applied research; the development of investment technologies and human resources in scientific research fields; the development and improvement of technologies; and follow-up innovations. The basic document governing scientific activities is the Law on Scientific Research. This law is applied in those cantons that have not yet enacted their own by-laws.

Ministry of Development, Entrepreneurship and Crafts of FBiH

Laws related to promoting eco-innovation on a federal level cover the following areas:

- stimulating development, entrepreneurship and crafts;
- supporting the application of innovations and the introduction of modern technologies in the areas of entrepreneurship and crafts;
- increasing the share of entrepreneurship and crafts in the economy;
- enabling entrepreneurship in the economy; and
- training entrepreneurs and craftspeople.

Environmental funds

In Bosnia and Herzegovina, environmental funds have been established in both entities. The Environmental Fund of the Federation of Bosnia and Herzegovina (EFFBiH) and the Environmental Fund of Republika Srpska (EFRS) were founded by the governments of the entities under their respective laws on environmental funds (established in 2006 in FBiH and 2002 in RS) defining all the necessary conditions and the scope of activities of the funds. The funds were established for the purpose of collecting and allocating funding for the development of water management infrastructure, waste minimisation and the adoption of integrated waste management, as well as the construction of other municipal infrastructure facilities necessary to meet EU accession standards.

Environmental Fund of RS

The EFRS is largely funded via the state budget, but it has all the administrative predispositions for the independent collection of funds from foreign and international sources, such as loans from IFIs and soft loan schemes. Starting from 2008, EFRS revenues are secured through fees for the use of natural resources and for environmental impacts; the RS budget; fees levied on polluters; and grants (EFRD, Institutional Profile, 2008). Funds are allocated through loans, subsidies, financial help and donations. Since money is also allocated to the EFRS from water fees as well (15 percent of total revenues), the Ministry of Water Management, Forestry and Agriculture requires that the EFRS dedicate those funds to water protection activities. It was foreseen that in 2008 approximately EUR 500,000 would arrive to the EFRS account.

Environmental Fund of FBiH

At the time of publication, there is no staff at the EFFBiH and documents regulating the work of the fund are still in a draft stage. Initial funding for establishing the institution has been received and additional revenues, such as water charges, have been allocated to the fund since 2006. Unrealised finances are expected to be accumulated and dedicated to environmental projects after the fund becomes operational (EFFBiH, Institutional Profile, 2008). IFIs have a strong interest in establishing a fund that would help both entities’ environmental funds to apply jointly for IPA and bilateral donor funding. At present, the status of the EFFBiH appears complex and the decision to start operations could depend on strong external technical assistance capable of establishing its foundation as a solid environmental institution in FBiH.

Croatia

In the early years of transition to an open market, the Croatian economy experienced a sharp decline in output, exacerbated by national conflicts in the Western Balkans. Thereafter, growth was resumed and during the past 10 years the Croatian economy has experienced significant
growth rates. Croatian GDP regained its pre-war levels in 2005, when GDP per capita was equal to approximately USD 8,800. Real GDP grew by 5.6 percent in 2007, the highest rate since 2002, but growth was considerably lower in 2008 as a result of the global economic recession (EC 2009a).

The growth is driven by gross fixed capital formation, the stimulation of private consumption and industrial development, retail trade widening and ongoing financial intermediation. Until 2008 the inflation rate was flat due to central bank efforts to stabilise exchange rates and government fiscal consolidation policy. However, inflation trends started to reassert themselves as a consequence of climbing global food and oil prices and weakened pressure on the demand side (WB 2009).

The process of economic transition to a market economy in Croatia has achieved significant results through the maintenance of macro-economic stabilisation and price liberalisation. The country is considered a functioning market economy. The restructuring and privatisation processes of the banking sector are almost complete, while privatisation of the corporate sector has been proceeding unevenly. A particular challenge is the restructuring of large state enterprises in the shipbuilding, agriculture and steel sectors. The current share of the private sector in total production is about 60-70 percent (EC 2009a).

Croatia’s mid-term economic prospects remain favourable with a view to future EU membership and the provision of future structural reforms related to reducing state ownership. The telecommunication, energy and transport sectors have already been affected by the market liberalisation process. The acceleration of privatisation and restructuring of enterprises is the main challenge for the country (EBRD 2009).

Much more needs to be done to improve the transparency of public finances through inclusion of all off-budget operations in the general government accounts, and to achieve considerable reductions in overall government spending. Accelerating progress in implementing health care reforms is needed to help the government to avoid paying off debts of state-owned hospitals and independent health insurance providers, especially when pension reforms are also needed. Furthermore, slowly growing external indebtedness should also be monitored carefully (EBRD 2009).

The desk research and survey show that the most important strategies and plans relevant to supporting eco-innovation are in place in Croatia. The primary legislation is generally of good quality and well aligned with relevant EU directives. The secondary legislation is also well aligned with EU directives (although not to the extent of EU member states). However, the legislation is not that well aligned with national and local conditions, which causes problems in implementation. In spite of that, the implementation of the laws and regulations, and actual support to eco-innovations, is at a more advanced level than in other countries covered in this study, especially in the domain of energy efficiency and renewable energy.

According to information obtained from interviews, the current regulations (secondary legislation) do not provide enough incentives for introducing eco-innovation and implementing eco-technologies, and the current financing mechanisms, both domestic and international, are overly administrative and slow in most cases. Still, there are examples where procedures have been quick, since the time needed does not depend only on the financing mechanisms but also on the capacity of the project proponents to provide all necessary documentation. In cases of smaller projects, developers often decide to self-finance a project rather than wait for a lengthy administrative procedure in order to obtain support from one of the existing applicable mechanisms.

Relevant strategies, plans and legislation

**Croatian Science and Technology Policy 2006-2010**

The primary objectives of the Croatian Science and Technology Policy 2006-2010 are to promote the creation and growth of knowledge-based enterprises; create technology infrastructure to support knowledge-based SMEs and technology-based start-ups; stimulate demand for R&D from business; manage intellectual property; diversify funding sources for R&D; attract private sector investments and create a risk capital industry; and promote public confidence in science and innovation.

**Draft National Sustainable Development Strategy**

The Draft National Sustainable Development Strategy of Croatia (NSDS) demonstrates the need for R&D and innovation in the field of eco-technologies. In addition to these general statements, R&D and eco-innovation are included in one of the basic principles, two sets of measures, and one set of indicators as outlined below. However, there are no numerical targets set, either for measures or for indicators. Such targets could be included in the final version of the strategy, or in a relevant follow-up implementation planning document.

Among the 13 basic principles of directing Croatia towards sustainable development, one is to “use the best avail-
able knowledge in ways that are technologically, economically, socially and environmentally justified, by applying cost optimisation” (NSDS page 5). Among the eight key sustainability challenges identified for Croatia, two are relevant: “Sustainable Production and Consumption” and “Interconnectivity.” The main goal for sustainable production and consumption is “to achieve a stable economic growth and to decouple it from environmental degradation.” One of the 16 measures to achieve this goal is to “invest into scientific research and to apply new, cleaner, and environmentally more efficient technologies with less use of natural resources...” (Sustainable Production and Consumption Measure Nr. 14, NSDS, page 19).

The main goal for interconnectivity is to connect all parts of the territory (including islands) with a transport network, while at the same time trying to minimise unwanted effects on the economy, society and the environment. One of the 10 measures is to “stimulate the use of clean fuels and technologies (sea-ways, biodiesel, ethanol etc.) and the transition to transport modes that are energy efficient” (Interconnectivity Measure Nr. 1, NSDS, page 19).

Among the eight sets of Croatian sustainable development thematic indicators presented in a table (on pages 36 to 39), the third set relates to sustainable production and consumption, and the fifth to energy. In personal communications with representatives of various ministries, it was learned that during the sessions of the NSDS working groups, there were discussions on eco-innovation. However, there is no wide recognition of the eco-innovation issue among the participants in the working groups as yet. Therefore (and in the absence of target values), it remains to be seen whether the measures described above will be systematically applied in line with the strategy.

**National Strategy and National Plan for Environmental Protection**

The Croatian National Strategy for Environmental Protection (NSEP) and National Plan for Environmental Protection (NPEP) from 2002 were both published in the Official Gazette (OG) No. 46/02. Among the main priorities of the National Strategy for Environmental Protection is the establishment of solid relationships with financial institutions and EU funds that could finance projects in all sectors of environmental protection. The strategy defines economic instruments for financing environmental priority sectors, including the sector of sustainable energy. In this context, the strategy supports the financing of measures for energy efficiency; for reducing emissions from existing energy facilities; for reducing the use of fossil fuels; for the improved use of renewable energy sources; and for the production of environmentally acceptable fuels.

The strategy also stipulates economic measures such as co-financing projects to increase energy efficiency in existing facilities; stimulating the introduction of renewable energy sources; subsidising green fuels; introducing additional taxes on the use of fossil fuels; strengthening the differentiation of energy prices; imposing taxes on fuels according to expected CO₂ emissions; introducing
taxes on CO₂ emissions; and subsidising more energy-efficient household appliances, all of which have a direct stimulative effect on green-tech enterprises and eco-innovation. Other than the emphasis on market-based instruments for stimulating the implementation of eco-technologies in the specific sector of sustainable energy, other initiatives for stimulating eco-technologies in cleaner production and recycling were not evident. Provisions for stimulating research, development and innovation in any of these sectors could not be identified.

The accompanying National Action Plan for Environmental Protection does touch upon recycling and cleaner production in addition to sustainable energy, but again not specifically in relation to research, development and innovation, but only on the implementation of existing best available technologies.

In the section on industry and mining (subsection 5.1.1.5 – Objectives and Measures) the key objectives include “a general framework for clean and sustainable production and to reduce basic and energy inputs for the purpose of stimulating a permanent development, increasing the recycling level and preventing environmental accidents.”

In the section on energy (subsection 4.1.2.4 – Objectives and Measures) the environmental protection objectives include, inter alia: increased energy efficiency, the modification of technology for the generation of energy and fuels for the power industry in an environmentally acceptable manner; and the reduction of the age of components and equipment built in power generation facilities.

In the section on consumers and consumption (subsection 4.1.7.4 – Objectives and Measures), the environmental protection objectives include the “shift of focus in industrial production caused by the introduction of cleaner technologies (durable products, re-use, recycling, use of secondary raw materials . . . to involve [consumers] in the system of separate collection of waste . . . to set the framework for determining the payment of the actual (full) price of the product for consumers . . . [and] to implement the principle of internalisation and encourage market mechanisms to enable acceptable prices of environmentally acceptable products.”

All the above-mentioned objectives also have appropriate sets of measures assigned in a table at the end of each subsection. These objectives and measures can be seen as directly and/or indirectly stimulating the implementation of eco-technologies and eco-innovation. Each of the above objectives and measures have assigned “possible sources of finance” that include the government budget, the economic sector; (local) city or municipal budgets; international sources; and county budget.

**Law on Environmental Protection**

The Law on Environmental Protection (Official Gazette, No. 110/07) regulates the financing instruments for environmental protection. Among other environmental goals (Article 6) the law stipulates:

- the rational use of energy and encouraging the use of renewable energy;
- the achievement of sustainable production and consumption; and
- the abandoning and replacement of the use of hazardous and harmful substances.

In Article 34, the law stipulates that the government has the obligation to provide funds for improving the environmental protection system. Article 38 defines the duties of the Environmental Protection and Energy Efficiency Fund (EPEEF) and the collection and dispersal of funds for the EPEEF, which are further elaborated in Article 174. In this respect the law was harmonised with the previously enacted Law on the Environmental Protection and Energy Efficiency Fund discussed below. Article 176 stipulates the duty of the responsible ministry to reward special achievements in finding the best practicable solutions in production processes regarding environmental quality impacts, and development and research projects for environmental protection.

**Investment Promotion Law**

The Investment Promotion Law (2000) is aimed at stimulating economic growth, development and the implementation of Croatia’s economic policy, and its integration into international trade through increased exports and competitiveness. It defines a system of incentive measures and tax and tariff privileges for 12 main categories, the most important of which for this study are:

- the introduction of new equipment and modern technologies;
- the introduction of new production processes and new products;
- the development of new services;
- energy savings;
- cooperation with foreign financial institutions; and
- bringing the Croatian economy into line with European standards.

The law is accompanied by the Regulation on Investment Incentives, enacted in 2001 and replaced by a significantly improved version in 2006, with more specific
provisions for research and for the development and commercialisation of new products and technologies.

Legislation relevant to state aid for innovation

Between 2005 and 2008, the Croatian Ministry of Finance enacted a number of legal documents of which the most relevant for this study are the Act on State Aid (Official Gazette, No. 140/05); the Regulation on State Aid (Official Gazette, No. 50/06); the Decree on the Rules of State Aid (Official Gazette, No. 121/06; 45/07; 13/08); and the Decree on the Rules of State Aid for R&D and Innovations (Official Gazette, No. 84/07). Other relevant decrees are those on state aid for SMEs (Official Gazette, No. 39/08), investing risk capital in SMEs (Official Gazette, No. 91/08), and state aid for higher education and research (Official Gazette, No. 91/08).

The Decree on the Rules of State Aid for R&D and Innovations refers to the EC state aid rules and the need to comply with the requirement not to contravene free market competition (Section 1.1 – Goals). In Section 2.1 (Scope), the decree defines three eligible sectors for R&D and innovation, where the priority is given to environmental protection, optimal energy use, waste management and security. Therefore, this decree can be seen as a direct and explicit driver for eco-innovation and R&D in the sectors of sustainable energy, recycling and cleaner production.

Law on the Environmental Protection and Energy Efficiency Fund

The Law on the Environmental Protection and Energy Efficiency Fund (Official Gazette No. 107/03) defines the duties and funding mechanisms of the EPEEF. Apart from financing environmental protection, energy efficiency and renewable energy projects, the fund has the role of providing technical assistance for the preparation of such projects. The fund can participate in co-financing programmes funded by international funding mechanisms as well. Further details are stipulated in the Statute of the Environmental Protection and Energy Efficiency Fund (Official Gazette No.193/03, 73/04). The assets of the EPEEF can be used, among other purposes, for:

- promoting cleaner production, and avoiding and reducing waste and emissions in the production process;
- implementing national energy programmes;
- encouraging the use of renewable energy sources (solar, wind, biomass etc.);
- promoting sustainable construction; and
- promoting educational, research and development studies, programmes, projects and other activities, including demonstration activities.

Air Protection Law

The Air Protection Law (Official Gazette, No. 178/04, 60/08) lays down provisions for financing research and development (i.e. eco-innovation) in environmental protection matters, and especially regarding climate change mitigation measures (Article 60). It also stipulates that investments in air quality protection and renewable energy solution technologies, measures, and equipment can be exempted from taxes, subject to subsequent regulations (Article 61).

Energy Strategy and its Implementation Programme

The current Energy Strategy of Croatia (Official Gazette, No. 38/2002) contains brief sections on energy efficiency and renewable energy goals and policies (pp. 10, 11). Its objectives include improved efficiency in energy production, transformation, transmission, transportation, distribution and consumption; the utilisation of renewable energy sources; realistic and market-related energy prices; the development of an energy market and entrepreneurship; and privatisation processes that encourage energy efficiency, good energy management and environmental protection. This implies action primarily in connection with energy efficiency, renewable energy sources, the choice of energy-generating products and the application of state-of-the-art protection technologies.

The 2002 strategy was accompanied by the Programme of Implementation of the Energy Sector Development Strategy, which was a package of sub-programmes including those in the domain of energy efficiency and renewable energy, namely: KUENEgrada (Energy Efficiency in Building Construction); MIEE (Industrial Energy Efficiency Network); KOGEN (Cogeneration Programme); KUENcts (Centralised Thermal Systems’ Energy Efficiency Programme); TRANCRO (Transport Energy Programme); BIOEN (Biomass and Waste Energy Use Programme); SUNEN (Solar Energy Use Programme); ENWIND (Wind Energy Programme, which included a programme of continuous wind monitoring in Croatia and the development of pre-commercial wind turbines, and has resulted in several commercial wind projects); as well as MAHE (Small Hydro-Plant Construction Programme) and GEOEN (Geothermal Energy Use Programme). Most of these
programmes are still in progress and all are financed from the EPEEF, while some of them are also supported by various international funding mechanisms (UNDP, FAO, UNECE, IEE, WB, GEF, and several EU programmes).

Green Paper for Energy Strategy Update and the Energy Efficiency Master Plan

The current Green Paper for the Energy Strategy Update is being drafted by the Ministry of Economy, Labour and Entrepreneurship with UNDP assistance. Chapter 4 of the green paper, dealing with concrete activities and measures, is dedicated to energy efficiency. In general, these measures and activities will enable the development of energy markets and market-based energy prices, a legislative framework for stimulating energy efficiency, a national institutional framework for implementing the energy efficiency policy, and financial support for implementing energy efficiency measures, including "innovative mechanisms of financing." Furthermore, the activities and measures are precisely designed for the industrial, transport, household and services sectors. Chapter 9 of the Green Paper for the Energy Strategy Update is dedicated to renewable energy sources with clear goals for the installation of energy production capacities and production targets up to 2030 for biomass, biofuels, wind, mini-hydro, geothermal and solar energy. These clear objectives will have a direct impact on stimulating eco-innovation and implementing eco-technologies in the sustainable energy sector. The Energy Efficiency Master Plan has been prepared together with the Green Paper for the Energy Strategy Update, and it relates to the 2008-2016 period. Following the energy efficiency objectives laid out in the Energy Strategy, it prescribes necessary short-term (2008-2010) and long-term (2011-2016) measures. The implementation plan also nominates responsible implementing institutions, target groups and sectors, the envisaged budget, and possible sources of financing (Energy Efficiency Master Plan, pp. 67-73).

According to the plan, the share of renewables in energy consumption will reach 20 percent by 2020, reaching production of 88.42 petajoules (PJ) (around 2.1 MToe). Currently, hydropower is the biggest renewable energy resource in the country (more than 20 PJ/year) as considerable hydro-infrastructure has been inherited from the past. Currently, the wind sector is developing most rapidly. However, according to the plan, biomass should be the major renewable source (along with hydro, which will increase only slightly from the current level).

Legislation related to stimulating sustainable energy production

The Energy Act from 2001, as updated in 2007 (Official Gazette, No. 68/01; 76/07), supported by the Electricity Market Act (Official Gazette, No. 177/04) and the Act on the Regulation of Energy Activities (Official Gazette, No. 177/04; 76/07), contain provisions for state support to energy efficiency and renewable energy. In 2007, the Energy Act was supplemented by five regulations relevant to stimulating sustainable energy production and reaching renewable energy targets.

- Regulation on Fees for Promoting Electricity Production from Renewable Energy Sources and Cogeneration (Feed-in Tariffs Regulation, Official Gazette, No. 33/07).
- Tariff System for the Production of Electricity from Renewable Energy Sources and Cogeneration (Official Gazette, No. 33/07).
- Regulation on the Minimum Share of Electricity Produced from Renewable Energy Sources and Cogeneration Whose Production Is Incentivised (Official Gazette, No. 33/07).
- Ordinance on the Use of Renewable Energy Sources and Cogeneration (Official Gazette, No. 67/07).
- Ordinance on Attaining the Status of Eligible Electricity Producer (Official Gazette, No. 67/07).

The Feed-in Tariffs Regulation sets the mandatory tariffs for electricity from renewable energy sources according to the type of source. Green electricity producers that have signed a contract with the market regulator are eligible for these tariffs. The regulation defines subsidies for electricity from renewable sources and cogeneration units and defines the amount of the subsidy and how it has to be calculated, raised and allocated for the years 2007 to 2010 as follows:

- 2007: EUR 0.0012 per kWh
- 2008: EUR 0.0027 per kWh
- 2009: EUR 0.0037 per kWh
- 2010: EUR 0.0048 per kWh

Waste Management Strategy

The Waste Management Strategy of the Republic of Croatia (Official Gazette, No. 130/05) and the Waste Act (Official Gazette, No. 178/04, 111/06, 60/08) provide detailed stipulations for developing an integrated recycling system in the country; research and development in
the field; and a wide spectrum of eligible mechanisms for financing these activities. The strategy envisions financing from non-earmarked state funds, earmarked funds (through the EPEEF) as well as regional and local administration funds, in combination with venture capital, concessions and other forms of public-private partnerships, pre-accession, Cohesion and Structural Funds, as well as soft loans from IFIs and the Croatian Bank for Reconstruction and Development.

In the section on the waste management vision, recycling and recovery are a means to achieve the ideal zero-landfilling state. The priorities for realising the Waste Management Strategy include increasing waste management fees, increasing waste management funds, increasing waste separation, and building facilities for integrated waste management, which in principle are (albeit indirect) drivers for stimulating the implementation of eco-technologies and, even more indirectly, of eco-innovation in the waste sector, including recycling. The strategy estimates that the total funds needed for its implementation from 2006 to 2015 amount to EUR 3.2 billion. Half of that sum should be provided from public sources (state budget, EPEEF, as well as regional and municipal funds). The other half is envisaged from other sources (venture capital, public-private partnerships, own sources, grants and preferential loans from IFIs).

Waste Act and Regulations

The Waste Act (Official Gazette, No. 178/04, 111/06, 60/08) and its waste management objectives (Article 5) include the development of clean technologies. Specifically, this includes the more efficient use of natural resources, the technical development and promotion of products that minimise the negative impacts of waste and pollution, the recovery of energy and material from waste, and the implementation of the most technically and economically effective available technologies. Article 36 defines the responsibilities of the importers and producers of waste-generating products and their packaging. These responsibilities are further specified in the Regulation on Packaging and Packaging Waste (Official Gazette, No. 97/05), which also determines the fixed-level (HRK 0.50, or approximately EUR 0.07) return fee for standard PET, aluminium and ferric beverage containers. The fee goes to the account of the EPEEF. All retailers selling products in these containers are obliged to take back the containers and return the fee to the consumer.

The introduction of the return fee created both positive and negative effects. It increased the EPEEF’s budget significantly, as well as the number of collected bottles, especially PET. However, it also killed the so-called ‘green islands’ schemes that existed until 2005 and that included glass and paper. In Zagreb, for example, there were a large number of green islands at a convenient distance from most residential areas, while by early 2009 there were only five points in the whole city where it is possible to take glass and paper. The lack of convenience has resulted in a loss of citizen motivation, resulting in a considerable reduction in the amount of glass and paper being collected.

Thus, the amount of collected PET has grown, while the amounts of collected glass and paper have dropped significantly. Furthermore, since the commercial production price of a PET container is only HRK 0.23 (approximately EUR 0.03), it created a whole range of illegal mini-businesses (so-called garage PET blowers) that produce PET bottles and return them to retailers at the expense of the national budget and the environment.

Apart from switching to the commercially priced beverage container return fee, several respondents mentioned that at least part of the income from the return fee should be earmarked for organising schemes for collecting and recycling other recyclable waste streams, such as secondary and tertiary packaging, such as used wooden transport pallets. Currently, companies are required to pay public utility companies to take away the pallets, even though this is a valuable secondary material resource.

Without earmarking, the EPEEF’s financial support is focused on the remediation and closure of existing waste dumps, and partly on supporting project preparation for future regional sanitary landfills, which is, of course, a political priority, both domestically and in the EU accession context. However, many respondents expressed the opinion that new regional management centres and integrated recycling systems should have the same (if not bigger) priority, as closing old dumps. In the past and current period bigger portions of financing should have been directed at supporting the recycling industry in all its sub-sectors, based on market principles, as well as into the development of best available technologies, not only into recycling but also in material and energy production. This would, in turn, both directly and indirectly stimulate eco-innovation and the replication and implementation of best technologies by domestic companies and researchers.

Currently, only the PET recycling sub-sector is entirely supported, and even that on non-market principles, which in turn creates monopolistic conditions, kills competition and demotivates research, innovation and technology replication and implementation, in both the PET and other recycling sub-sectors.

The regulations on waste from electric and electronic
equipment and on waste tyres are also not optimised for the domestic market and infrastructure conditions, which makes the recycling of these materials unprofitable, and in the case of waste tyres counterproductive, because of the excessive transport distances and resulting CO₂ emissions. Charges for waste from electric and electronic equipment are based only on weight, and not on the specifics of the products, which results in the fact that only large products of simple structure are being recycled. The economic losses in these schemes are being covered from the EPEEF and the state budget, instead of being invested into developing more efficient and profitable recycling schemes, as well as into research and development in the area of cleaner production.

Institutions and stakeholders

Ministry of Science, Education and Sport

Within the Ministry of Science, Education and Sport, the department responsible for the development of technical culture, which promotes innovations and related activities among non-governmental organisations, is particularly relevant for eco-innovations. Scientific research in Croatia is monitored and conducted in six fields of science: natural, technical, biomedical, biotechnical, and social sciences and humanities. The system is currently financed through direct project financing with a mechanism of annual monitoring of results; financing of junior researchers on tangible projects, with multi-year monitoring of their progress (acquiring a master’s and a doctoral degree, and publishing scientific papers); and through financing research and technology development equipment.

Ministry of Economy, Labour and Entrepreneurship

The Ministry of Economy, Labour and Entrepreneurship (MoELE), through its Department for Stimulating Investments and its Energy and Mining Division, is the ministry in charge of energy policy. The ministry submits to the government energy needs assessments and policy proposals, and drafts secondary legislation and/or regulations in collaboration with the Croatian Energy Regulatory Council, in order to establish general principles on the basis of which the Croatian Energy Regulatory Council acts. In the past several years, the ministry has enacted a large number of regulations with an aim to facilitate easier project development in the field of energy efficiency and renewable energy.

The MoELE’s Energy and Mining Division consists of the following departments:

- Energy;
- Strategic Planning and Energy Balance;
- Energy Systems;
- Renewable Energy Resources and Energy Efficiency;
- Energy Balance, Review and Market; and
- Common Activities and International Cooperation.

The Renewable Energy Resources and Energy Efficiency Department is further divided into three units: one for energy efficiency, one for renewable energy, and one for biofuels. Chapter 4 describes the positive role of the MoELE’s Department for Stimulating Investments and Energy and Mining Division in stimulating research, development and the actual application of energy efficiency and renewable energy technologies. The ministry is managing the Renewable Energy Legislation and Energy Efficiency Labelling (RELEEL) Project, the main aim of which is to channel EU funds for EE and RES projects and to provide technical assistance for project proponents.

Bodies and mechanisms relevant for sustainable energy

Croatian Energy Market Operator

The Croatian Energy Market Operator (HROTE) was established in 2005 in accordance with the legislative changes related to the restructuring of the energy sector in Croatia. The duties of the HROTE are set out in the Electricity Market Act. The HROTE is a public service and it carries out the activities of organising the electricity market in order to promote its sustainable, efficient and equitable development. The Croatian Government has started to reform the energy sector in order to push the share of renewable energy sources from its current 1 percent to 5.8 percent by 2010. As mentioned above in the section on legislation, the Croatian support system is based on the obligation of all electricity buyers to pay an incentive fee (levy), and on the electricity purchase obligation on the HROTE, which pays (partially out of the incentive fee funds) an incentive price to eligible producers. The incentive fee is paid by all electricity buyers, as a “supplement to the electricity price”. Each electricity user pays a supplement on top of the normal fee defined in the Regulation on Feed-in-Tariffs (Official Gazette, No 33/07). The funds obtained through the supplement are distributed by the HROTE to the eligible green energy producers (as defined in the Ordinance on Obtaining the Status of Eligible Electricity Producer. Official Gazette No. OG 67/07). The operations of the HROTE are overseen by the Croatian Energy Regulatory Agency.
The Croatian Energy Regulatory Agency

The Croatian Energy Regulatory Agency (HERA) was founded as a public institution based on the Act on the Regulation of Energy Activities. Its main aim is to design and implement the regulation of energy activities.

The activities of the HERA listed below include those that are directly relevant for stimulating and financing RE and EE:

- providing opinions to the responsible ministry on the tariff system for electricity produced from renewable sources and cogeneration; on compensation for providing incentives for renewable sources and cogeneration;
- providing opinions to the relevant ministry on the proposed amounts of compensation for the organisation of the electric energy market;
- supervising the application of all tariff systems and prescribed compensations;
- providing opinions to the relevant ministry on procedures and criteria for the approval and construction of generating facilities;
- publishing information and data on energy efficiency and the use of energy;
- participating in energy policy design;
- settling disputes related to carrying out regulated energy activities, in particular with regards to the following:
  - rejection of connection to the transmission network/transport system;
  - determination of compensation for connection to and usage of the transmission network/transport system;
- monitoring objective, transparent and non-discriminatory conditions and tariffs for the connection of new electricity producers, especially taking into account costs and benefits of renewable energy sources, distributed generation and cogeneration;
- monitoring the extent to which the transmission system operator or the distribution system operator fulfils its tasks pursuant to the Energy Act and laws governing individual energy activities;
- monitoring the degree of transparency of market competition;
- issuing licences for carrying out energy activities, and also temporarily and permanently revoking these licences;
- issuing rulings on granting the status of eligible producer, and also temporarily and permanently revoking these rulings; and
- providing opinions to the relevant ministry on the proposed amounts of tariffs.

HEP-ESCO Ltd.

The energy service company HEP-ESCO Ltd. develops, executes and finances energy efficiency projects on a commercial basis. HEP-ESCO provides a full range of energy services with repayment through savings. Their projects include modernisation, reconstruction and refurbishment of existing plants and facilities. Areas of business are divided into public and private sectors, covering buildings, public lighting, industry and energy supply systems. HEP-ESCO is the implementing agency for Energy Efficiency Project Croatia and is currently the key market creator of energy efficiency projects. More information about this project can be found in Chapter 4.

Croatian Energy Association

The Croatian Energy Association (HED) is an expert association that gathers, on a voluntary basis, experts and scientists in the field of energy industry. It is a non-profit, non-governmental organisation and a member of the World Energy Council. The HED provides scientific and expert assistance in the elaboration and establishment of energy policy and improves energy-related culture in Croatia. It also facilitates international cooperation in the field of energy sciences and environmental protection, provides material and expert support to junior experts in the field of energy, organises expert conferences and courses in the field of energy industry, and supports the elaboration of regulation proposals, by-laws, recommendations, guidelines, instructions and standards.

Croatian Chamber of Economy

The Croatian Chamber of Economy’s Energy Association includes more than 150 Croatian companies registered to perform energy-related activities. The main role of this professional association is to promote the corporate interests of the Croatian energy sector. Its sub-unit, the Renewable Energy Sources Association was created in 2005 and currently has more than 60 members. The main aim of the association is to promote the utilisation of renewable energy sources in Croatia and to create conditions for the development and application of new technologies.

Croatian Center for Cleaner Production

The Croatian Center for Cleaner Production (CRO CCP) was established in 2000 with the aim of promoting the concept of cleaner production in Croatia. The centre's
services are intended for industry, administrative bodies, industrial associations, educational institutions, financial organisations and the public. The CRO CCP is a member of the Network of National Cleaner Production Centers of the United Nations Industrial Development Organization (UNIDO) and has three full-time employees.

The main activities of the CCP include education, advisory and consultation activities in the field of cleaner production (CP) and environmental management systems (EMS) through long-term training, seminars, workshops, lectures and consultations; the organisation, development and implementation of CP and energy efficiency projects in industrial companies, services and municipalities; cooperation with NGOs, educational, expert and governmental institutions in multidisciplinary projects (CP, waste minimisation, environmental management systems, waste management systems, sustainable development and environmental protection); the implementation of projects in the field of Directive 96/91/EC on Integrated Pollution Prevention and Control (IPPC); and the performance of best available technology assessments based on best available techniques (BAT) reference documents (BREFs).

To date, 65 industrial companies have participated in cleaner production programmes with 218 people trained in CP and EMS. According to the CCP, an estimated EUR 11 million is being saved in total annually through their current 184 projects.

**Business Innovation Centre of Croatia**

The Business Innovation Centre of Croatia (BICRO) aims to upgrade the technological capabilities of enterprises through technology development programmes; the promotion of venture capital in Croatia (with an emphasis on the commercialisation of R&D results and the development of private firms and research organisations); the development of technology centres, incubators and R&D centres; and the provision of grants for financing the research projects of SMEs.

The RAZUM project focuses largely on pre-commercial and early seed financing. BICRO identifies the firms and evaluates their capabilities. According to BICRO, the RAZUM evaluation criteria are technically and financially sound and transparent while avoiding unduly bureaucratic procedures for participating firms. Technical expertise is sought during the evaluation stage and collaboration between the private sector and research community is thus strengthened. A special emphasis on promoting linkages between the R&D institutions and Croatian industry would be pursued through the continued participation of researchers and scientists in the evaluation and monitoring of BICRO sub-projects as well as in the provision of advice to entrepreneurs on technical matters.

BICRO also operates a grant-sponsored pilot research and development programme, IRCro, which finances applied research projects of eligible SMEs jointly with participating research and development institutes (RDI). The objective of the programme is to encourage SMEs to invest into research and development and facilitate RDIs/industry linkages, as well as to help RDIs expand their industry network and outreach. The IRCro Programme will fund up to 50 percent of the cost of the joint projects of RDIs and private sector SMEs in developing or adapting new products or processes. The IRCro financing would be provided on a grant basis to the beneficiary firm. The beneficiary firm will sub-contract research to participating RDIs and make royalty payments to the RDIs and will own the intellectual property rights.

**National financing mechanisms**

Major funds for national financing mechanisms (both for micro- and macro-projects) come from the Ministry of Environment and Spatial Planning, the EPEEF and the Croatian Bank for Reconstruction and Development (HBOR). Among the international financing mechanisms, the most important are those of the EC, UNDP, EBRD, and the World Bank. There are also smaller national funds available in other line ministries (e.g. ministries for investment, regional development, tourism, agriculture etc.) and relevant national and regional agencies (e.g. regional energy agencies) which can be used for sustainable energy, cleaner production and/or recycling, depending on the ability of a project proponent to fit their applications into the conditions of these funds.

**Environmental Protection and Energy Efficiency Fund**

The Croatian Environmental Protection and Energy Efficiency Fund, which is an extra-budgetary fund, became operational in 2004. A tool for implementing environmental policy and financing environmental programmes, at present it focuses primarily on co-financing municipal waste projects. The resources of the fund come from earmarked charges levied on environmental polluters and users, industrial waste and motor vehicle charges, budget transfers and revenues from international bilateral and multilateral cooperation in the field of environment (EPEEF, Institutional Profile, 2008). The fund’s resources are allocated through grants, soft loans, subsidised interest rates and loans from commercial
banks. The resources of the fund are primarily used to finance programmes and projects in accordance with the National Environmental Protection Strategy and National Environmental Action Plan, subsidised interest rates, strategic energy documents, and other relevant strategy documents and regulations. Financing is directed to general environmental protection purposes, sustainable use of natural resources, waste management (65 percent of overall expenditures in 2005-2008) and support for energy efficiency and renewable energy sources.

The EPEEF is responsible for the promotion and establishment of cooperation with international and domestic financial institutions. Jointly with the Croatian Bank for Reconstruction and Development (HBOR), the fund supports the Loan Programme for the Financing Project of Environmental Protection, Energy Efficiency and Renewable Energy Sources. The fund is also involved in managing EU assistance to Croatia and is currently implementing a project for developing waste management infrastructure under the IPA 2007-2009 Environmental Operational Programme. In 2006, the EPEEF disbursed a total of EUR 102 million. Out of that amount, EUR 100 million was allocated for environmental projects and EUR 2.35 million was allocated for energy efficiency projects (REC, PEIPCroatia Analytical Report June 2008).

Croatian Bank for Reconstruction and Development

A large share of projects receive funding through the EPEEF, the Croatian Bank for Reconstruction and Development (HBOR) and earlier EU programmes such as Phare and the Instrument for Structural Policies for Pre-Accession (ISPA). One of the priority objectives of the HBOR concerns environmental protection, the sustainable use of natural resources, energy efficiency, renewable energy and the financing of infrastructure, including environmental infrastructure (HBOR, Institutional Profile, 2008).

The bank has elaborated specific loan programmes: an infrastructure loan programme and an environmental protection loan programme dealing with the upgrade and reconstruction of municipal infrastructure. Loans are given for up to 15 years with a yearly interest rate of 4 percent for projects investing in specially protected areas and 6 percent for all others. In 2007, loans in the amount of EUR 66 million were approved by the HBOR to further promote investments in environmental protection and energy projects. HBOR’s Environmental Protection Programme includes support to recycling, energy efficiency and renewable energy sources. For this purpose HBOR is on-lending money from the WB and German development bank KfW allocated specifically for this programme.

The former Yugoslav Republic of Macedonia

A high degree of macro-economic stability in the former Yugoslav Republic of Macedonia has been achieved through the wide privatisation of state-owned enterprises, the improved transparency and accountability of public services, the creation of institutions for the regulation and supervision of the market economy and the provision of necessary legislation (EC, 2009a).

The country’s external balances are characterised by a relatively high and stable trade deficit equal to approximately 22 percent of GDP, and high inflows of worker remittances from abroad. The current account deficit has decreased significantly in recent years as a result of the rise in these capital inflows. Unfortunately, foreign direct investment is insignificant, mostly related to privatisation projects and amounts annually to some 1-2 percent of GDP (EC, 2009a).

Broad-based growth of GDP was supported by the sharp increase of exports, the strong performance of industries and higher household consumption stimulated by higher wages, the growth of employment and better access to consumer credit (EBRD, 2009). Foreign and domestic investors reacted positively to the improvement of the investment climate and enforcement of the government investment promotion campaign. Private consumption was stimulated by higher wages, modest growth of employment and increasing access to consumer credit. The rise in inflation in 2007-2008 was launched by climbing food and energy prices and affected demand-side factors affecting inflationary pressures. The current account deficit increased significantly and reached around 14 percent of GDP in 2008, compared to 3.2 percent in the year before. Strong inflows of FDI prevented an escalating loss in import-coverage of reserves and a build-up in debt.

Unemployment and poverty are slightly declining, but much is still to be done in order to create a viable environment for the creation of well-paid and stable jobs in the private sector (WB, 2009). However, much remains to be done to create a stimulating environment for the generation of well-paid and stable jobs and private sector-led growth. Some institutional weaknesses are still in place, such as cumbersome and slow administrative procedures, judiciary shortcoming and a low level of property and land registration. The business climate is not conducive to the stimulation and growth of foreign and domestic investment (EC, 2009a). The labour market is deficient, impeding the reduction of high unemployment. Domestic and foreign investment has also been low.
Current laws and strategies do not pose any barriers to the general implementation of eco-innovations. However, there is a lack of supportive infrastructure (coordination of scattered and internationally supported activities, human resources capacity etc). Problems become more severe when going from the personal to the institutional and finally to the system level. At the personal level, the available human resources are insufficient and there is a need for training and other ways to improve extant skills and knowledge. The same holds for appropriate awareness-raising activities aimed at the modification of stakeholders’ behaviour, their attitudes towards new technologies, as well as the criteria according to which the eco-innovation, cleaner production, sustainable energy, and recycling-related decisions are adopted. This is particularly true in the context of supporting energy-efficient technologies, since in the former Yugoslav Republic of Macedonia, energy prices are still relatively low.

The institutional and systematic capacity is insufficient to create supportive institutions and to design, implement and enforce policies for eco-innovations and technology transfer, or to monitor their results. Since the relevant primary laws are mostly in line with the EU environmental acquis, it is not deemed appropriate to make any interventions in the legal framework. A number of by-laws are not yet in place. As described above, institutional and human resource capacities are inadequate to enforce and monitor laws, as well as to implement strategies.

There are no subsidies hindering eco-innovations. On the other hand, there are no systematic measures (except for a number of running programmes supported by international agencies) providing funding mechanisms for eco-innovation. There is a State Aid Law defining the rules for subsidies in the private sector; funds available for general state aid are not provided presently from national sources, while the continuity of calls for proposals is dependent on the provision of international funding. Subject to future success in the implementation of the national environmental investment strategy and the GEF-funded project on sustainable energy, eco-innovation will obtain sufficient funding. However, the key challenge is the strengthening of the institutions in order to increase the absorption capacity for international funding, in parallel with making available national financial resources for co-financing.

Relevant strategies, plans and legislation

International treaties and national strategies and plans relevant to sustainable energy

The applicable strategies and plans include the National Strategy for Renewable Energy Sources (2008); the National Development Plan 2007-2009 on improving the investment climate for the construction of new energy capacities, and for increased use of renewable energy sources; local energy efficiency programmes with action plans (ongoing); the First National Communication under the UNFCCC (2004); the Second National Communication under the UNFCCC (2008); the regular review of 2007, under the Protocol on Energy Efficiency and Related Environmental Aspects (PEEREA); the National Strategy on Clean Development Mechanism (February 2007); the Energy Community Treaty, ratified by the former Yugoslav Republic of Macedonia on May 3, 2006; the Association Agreement with the EU (2001); Article 99, promoting en-
ergy efficiency, renewable energy and the environmental impact of energy production and consumption; and the energy efficiency strategy accompanied by implementation plans and technical programme analysis (2004).

**Law on Environment**

The Law on Environment encourages the use of renewable natural energy sources, and encourages the use of products, the application of cleaner production and the use of clean technologies that are most beneficial to the environment. The principles of the law (Article 15) include the principle that cleaner production by applying a comprehensive environmental protection strategy concerning raw materials, production processes, products and services, shall be encouraged so as to reduce the risk to human life and health and the environment while increasing economic and ecological efficiency.

The Law on Environment also defines an Annual Investment Programme (for environmental protection) aimed at stimulating/funding the following activities: development and implementation of programmes, projects and preventive measures and measures intended to support the preservation and sustainable use, protection and improvement of the environment, especially for:

- the encouragement of cleaner production;
- the substitution of fossil fuel use with natural gas, biogas, other types of environmentally acceptable fuels;
- the improvement of environmental monitoring and state of the environment assessment and the introduction of an environmental management system;
- the encouragement of the sustainable use of natural resources;
- the encouragement of the achievement of environmental standards in the course of economic activities; and
- the encouragement of educational, research and development studies, programmes, projects and other related activities for environment and nature protection and improvement.

The funds of the Annual Investment Programme are provided from a set of environmental charges stipulated in the Law on the Environment. Presently, EUR 3.5 million is available for a call for proposals based on Annual Investment Programmes being issued by the Ministry of Environment and Physical Planning and approved by the government. Most of the funds are used in project preparation and investments for small-sized communal infrastructure, while eco-innovation is seldom supported due to the lack of interest on the part of project beneficiaries and the associated risks.

**Energy sector legislation**

The Energy Law was adopted in 2006, and the secondary legislation for the implementation of the law in the field of energy efficiency includes: regulations for energy efficiency labelling of household appliances (2007); regulations for energy efficiency of new buildings and reconstruction of existing ones (pending); and technical specifications and standards for the efficient exploitation of fossil fuels (pending).

**Strategies and plans relevant for supporting eco-innovation in industry**

Applicable strategies and plans include the Programme for the Development of the Entrepreneurship, Competitiveness and Innovation of SMEs (2007-2010); Strategy for the Industry Policy (draft); the National Strategy for Small- and Medium-Sized Businesses (2003); the Programme for the Stimulation of Investments in the former Yugoslav Republic of Macedonia (2003-2006); and the Second Programme for Improvement of Investments in the former Yugoslav Republic of Macedonia (2007-2010).

**Institutions and stakeholders**

**Agency for the Promotion of Entrepreneurship**

The Macedonian Agency for the Promotion of Entrepreneurship (APERM) belongs to the Ministry of Economy.

In 2002, APERM signed an agreement with the Small Business Development Center from Ljubljana, Slovenia (SBDC) for the realisation of the project Development of SMEs and Entrepreneurship in SEE. The project was supported by the Stability Pact for SEE, Central European Initiative (CEI), and the Ministry of Economy of the former Yugoslav Republic of Macedonia and originally consisted of three subprojects: establishment of a business cooperation network; entrepreneurial training; and twinning actions.

Important national support for EE and RE investments come from the appropriately created incentives, firstly feed-in (preferential) tariffs for electricity generated from small hydro, wind and biomass power plants, adopted by the Energy Regulatory Commission in 2007. In order to stimulate the use of solar energy in the country, the government established a subsidy scheme, according to which the Ministry of Economy provides repayment in the amount of 30 percent (not more than EUR 300) of costs for the first 500 buyers of solar thermal...
collectors for their homes. In addition to this is the adoption of the Law on Amending the VAT Law, which anticipates the reduction of VAT from 18 percent to 5 percent for thermal solar systems and components.

**Macedonian Bank for Development Promotion**

The main objective of the bank is to promote exports through providing credits and other forms of support; and to support the development of SMEs by providing investment credits as well as providing insurance of claims based on performed exports against short-term commercial risk.

**European Information & Innovation Centre of the former Yugoslav Republic of Macedonia**

The aim of the European Information and Innovation Centre (EIICM) is to create new prosperity by attracting highly skilled scientists and engineers as well as companies that have the potential to innovate and to turn innovation into commercial opportunity. The EIICM provides a framework for industry and academia to identify partners worldwide and to cooperate throughout the full innovation cycle. It offers broad-based technology trials and benchmarking, involving a worldwide R&D community, ensuring the general applicability of the technology developed and providing a better understanding of global markets through improved market intelligence.

**Foundation for Management and Industrial Research**

The Management and Industrial Research Foundation (MIR) was established in 2002 by SINTEF, a Norwegian foundation for scientific and industrial research. The mission of the MIR foundation is to initiate, execute and support scientific and industrial research and development in the area of business development. The mission is realised by the preparation and implementation of projects, expert research activities, training, information collection, programmes and restructuring, market research technology and knowledge transfer, and other activities in support of Macedonian SMEs as well as large companies and entrepreneurship. The MIR Foundation has formed a consortium with three local institutions, and this consortium was awarded its first project from the EC CIP (Competitiveness and Innovation Framework Programme: the establishment of the European Information and Innovation Centre in the former Yugoslav Republic of Macedonia (EIICM)). The consortium coordinator is the University of St. Cyril and Methodius, Skopje, the MIR Foundation, the Agency for the Promotion of Entrepreneurship of the former Republic of Macedonia, and the Macedonian Economic Chamber are consortium members.

**National Cleaner Production Centre**

The headquarters of the Macedonian National Cleaner Production Centre (NCPC) is at the Department of Mechanical Engineering of the University of St. Cyril and Methodius, Skopje, the host institution for the centre. The activities of the NCPC are coordinated by UNIDO and financially supported by the Federal Ministry for European and International Affairs of Austria. They are crucial to the harmonisation of the former Yugoslav Republic of Macedonia with EU laws and standards. UNIDO supports the active role of the NCPC in the implementation of CP technologies in Macedonian companies. The first group of national experts started their training in Autumn 2007. This group comprises experts from various fields, including the mechanical engineering, chemical engineering, electrical engineering, technology, metallurgy, pharmacy, ecology, agriculture, and textile-leather industries, and all will be trained to become national experts for cleaner production as certified by UNIDO. After certification, these experts will train employees and teams in companies where they will work together for the successful implementation of cleaner production. This process is also expected to help the companies in preparing IPPC documentation. In every company, there are two to three representatives from the NCPC in addition to the team of the company. According to UNIDO rules, the licence that the trainers (experts) gain from the training is valid for two years, and renewal of the licence is subject to the number and quality of cleaner production projects performed in the meantime.

**NGO sector**

The mission of the Macedonian Centre for Energy Efficiency (MACEF) is to engage energy efficiency on the national level through cooperation with governmental institutions, engineers, donors and environmentalists. The Macedonian Consumers Organisation (OPM) is the primary advocate for consumer issues in the former Yugoslav Republic of Macedonia. The OPM has affiliated experts familiar with both the regulatory and technical aspects of energy efficiency programming and has prepared and disseminated materials regarding home insulation and the use of more efficient consumer appliances. From March 2006, the NGO Proaktiva is implementing the project Energy Efficient Municipality, applying the principles of energy efficiency, energy savings and renewable energy. The project is implemented in a closed frame, which can measure the project’s influence at the local level. The project is funded by the GEF Small Grants Programme and the Government of the Kingdom of Norway.
Montenegro

The main transition from a planned to an open market economy in Montenegro started in 2001. The country’s economy is relatively small in absolute and per capita terms, which is around 10 percent of the EU-27 average (EC, 2009). GDP growth was stable at an average annual rate of 5 percent between 2004 and 2008. Solid performance in financial services, tourism, construction and industrial production, along with recovering mining and improved operation of utilities, represented the key driving forces of this growth (EBRD, 2009).

Poor diversification of products is an inherent flaw of the export structure — unalloyed aluminium constitutes 56 percent of total exports. The other major exported goods are tobacco, food and beverages, raw material from wood and the timber industry and machinery. Nevertheless, Montenegro is becoming an increasingly popular tourist destination and is slowly increasing its status as a net exporter of services (EC, 2009).

The recent tendency of robust flow of foreign direct investment (FDI) into the country is continuing and promises to grow. Property accounts for a substantial share, approximately 40 percent of the total investments. The current account deficit is one of the highest among countries in transition due to the large need for imports in the tourism and construction sectors and accounts for about 32 percent of GDP. However, some expect a decline once this extraordinary flow of FDI decreases (EBRD, 2009).

The first stage of transition reforms achieved significant results in Montenegro. The liberalisation of prices, macro-economic stability and policy priorities are supported by the improved functioning of market mechanisms. Constantly pursued structural reforms are aimed at sustaining economic growth, and a credible and prudent mix of income and fiscal policies will guarantee the preservation of the macro-economic stability achieved. Furthermore, the privatisation of state-owned companies, utilities controlled by the municipalities and public institutions of general interest is necessary (EC, 2009).

The mid-term outlook for the country is positive, but risks are also substantial. The post-independence boom is associated with private property development, tourism and other service sectors. However, a more diversified economy is required to further maintain this level of growth along with prudent control of rates of inflation (EBRD, 2009). In the context of rising energy prices, the future of the main export earner, the aluminium smelter KAP (Kombinat Aluminijuma Podgorica), is uncertain as the company relies on low electricity prices to remain viable. The current high subsidies are due to end in 2010.

The tourism sector has great potential, but the large inflow of investments in property may cause the overburdening of the country’s weak infrastructure and a decrease in the number tourists. The country’s further integration into the Euro-Atlantic structure will continue, but slow institutional restructuring and the weakness of the public administration may affect the progress of the EU accession process (EBRD, 2009). The drafting of essential national strategies, plans and legislation is still ongoing. The majority of these strategic documents stem from the international commitments of Montenegro, including regional and international initiatives and conventions, and approximation to the EU.

### TABLE 5: Macro-economic indicators for Montenegro

<table>
<thead>
<tr>
<th>MACRO-ECONOMIC INDICATORS</th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP (in billion USD)</td>
<td>2.05</td>
<td>2.22</td>
<td>2.46</td>
<td>2.97</td>
<td>3.7</td>
</tr>
<tr>
<td>GDP growth (%)</td>
<td>4.2</td>
<td>4.1</td>
<td>6.5</td>
<td>6.5</td>
<td>6</td>
</tr>
<tr>
<td>GDP per capita (in USD)</td>
<td>3,922</td>
<td>4,100</td>
<td>4,300</td>
<td>4,795</td>
<td>6,200</td>
</tr>
<tr>
<td>Inflation (%)</td>
<td>3.1</td>
<td>3.4</td>
<td>2.1</td>
<td>4.2</td>
<td>5</td>
</tr>
<tr>
<td>Unemployment (%)</td>
<td>27.7</td>
<td>30.3</td>
<td>30.0</td>
<td>30.0</td>
<td>30.0</td>
</tr>
<tr>
<td>Exports (% of GDP)</td>
<td>42.5</td>
<td>44.3</td>
<td>30</td>
<td>27</td>
<td>24</td>
</tr>
<tr>
<td>Imports (% of GDP)</td>
<td>58.7</td>
<td>62.1</td>
<td>75</td>
<td>86</td>
<td>84</td>
</tr>
<tr>
<td>Current account balance (% of GDP)</td>
<td>-7.7</td>
<td>-8.8</td>
<td>-29.4</td>
<td>-32.2</td>
<td>-31.6</td>
</tr>
<tr>
<td>Budget deficit (% of GDP)</td>
<td>-2.7</td>
<td>-1.6</td>
<td>1.3</td>
<td>0.5</td>
<td>1.5</td>
</tr>
<tr>
<td>Gross foreign debt (% of GDP)</td>
<td>31.2</td>
<td>29.6</td>
<td>26.3</td>
<td>24.9</td>
<td>25.2</td>
</tr>
<tr>
<td>Foreign direct investments (% of GDP)</td>
<td>-</td>
<td>13.8</td>
<td>15.8</td>
<td>16.3</td>
<td>10.5</td>
</tr>
</tbody>
</table>

**Sources:** Complied by the REC from IMF, EIU, Central Bank of Montenegro, Statistical office of Montenegro, Ministry of Finance, 2009.
Relevant strategies, plans and legislation

Among the adopted strategic documents are the National Strategy for Sustainable Development, the National Programme for Integration into the EU, the Waste Master Plan and the Energy Efficiency Strategy. Legal regulations that are harmonised with the acquis communautaire include the Law on Integrated Pollution Prevention and Control, the Waste Management Act and the Energy Law. Apart from the new Environmental Law, the Energy Development Strategy of Montenegro and the Energy Policy, national strategies and policies for innovations, forestry and agriculture have been drafted.

Two international agreements signed by Montenegro triggered changes in the environmental sector. Ratification of the Kyoto Protocol enabled Montenegro to become a competitive host of Clean Development Mechanism projects, while participating in the Energy Community of South East Europe highlighted obligations to use renewable energy and raised awareness of energy efficiency in Montenegro.

National Strategy for Sustainable Development

The energy-related priorities of the National Strategy for Sustainable Development (NSSD, Section 5.1.2) include the more efficient use of electricity and a reduction in dependence on imported energy resources, with an emphasis on renewable sources of energy. This section of the strategy defines a target of 10 percent increase in energy efficiency by 2010, compared to 2005. Measures to improve energy efficiency include: reducing energy losses; implementing the Energy Efficiency Strategy through annual action plans; establishing the Energy Efficiency Fund and promoting, implementing and providing incentives for projects that will increase energy efficiency. To increase the share of renewable energy sources in Montenegro, the Strategy for Energy Sector Development should be adopted and national regulations should be harmonised with relevant EU legislation. A more efficient institutional, financial and regulatory framework is needed to achieve sustainable development goals in Montenegro.

In the section on industry (NSSD, Section 5.1.7) it is stated that one of the priority tasks is the improvement of industry’s environmental performance. The Law on Integrated Pollution Prevention and Control (IPPC) needs to be applied effectively and the market-based instruments need to be strengthened. It is also necessary to put in place incentives for investments in clean technologies and for energy efficiency in industry (e.g. to encourage the rational use of water). Special attention is given to strengthening partnerships and instruments that are based on voluntary principles such as EMAS, eco-labelling etc.

A priority NSSD task in the field of new technologies (NSSD, Section 5.1.8) includes support for research, development and innovations. Measures to achieve this goal include the preparation of the Strategy for Research and Development; the creation of economic instruments that would provide incentives for research; and the provision of technical assistance in the initial phases of developing and using new technologies. The main tasks set by the new legislative and strategic framework for waste management (NSSD, Section 5.2.10) in Montenegro include waste reduction, waste separation, adequate disposal and recycling in order to reduce waste pollution and preserve the resource base.

National Programme for Integration into the EU

The National Programme for Integration into the EU is designed for the 2008-2012 period. Section 3.15.3 on energy efficiency and renewable energy sources addresses the need for the Energy Efficiency Strategy to be updated and harmonised with the Energy Development Strategy by 2025, the National Strategy for Sustainable Development of Montenegro and new EU documents in the field of energy efficiency (Directive 2006/32/EC on the promotion of end-use efficiency and energy services, the Action Plan for Energy Efficiency etc.). The programme (Section 6.8) proposes the establishment of a national level recycling system with the following components:

- municipal waste separation;
- the provision of a decentralised recycling island system with sufficient coverage in urban and rural areas;
- provision of centralised civic amenity sites (CAS) located in every municipality, comprising 24 units in the country;
- establishment of eight inter-municipal catchment areas with one sanitary landfill in each; and
- inter-municipal cooperation agreements regarding joint operation of the inter-municipal landfills and utilisation of vehicles for the collection and transportation of recyclables.

The Draft National Policy for Innovation and Research

Among priority activities of this policy, innovation and research in the environmental and energy sectors are on the top of the priority activities list. Short-term activities in the period 2008-2010 specified in Section 6.2.5 (Technological Development and Innovations) of the policy are:
• the allocation of funds for co-financing scientific research projects related to technological development and innovation; and
• the establishment of rules for granting those funds, so that budgetary funds cover a maximum of 50 percent of expenses, according to the priorities defined in the strategy.

**Energy Community of South East Europe Treaty**

The Energy Community of South East Europe Treaty (ECSEE Treaty) has been created for SEE countries, candidates or potential candidates for accession to the EU. The treaty obliges them to respect the acquis communautaire related to energy. From the point of view of this background study, Section V of the Treaty on the Acquis for Renewables obliges contracting parties to produce plans for the implementation of Directive 2001/77/EC on the Promotion of Electricity Produced from Renewable Energy Sources in the Internal Electricity Market; and Directive 2003/30/EC on the Promotion of the Use of Biofuels or Other Renewable Fuels for Transport.

**Energy Development Strategy of Montenegro**

The Energy Development Strategy of Montenegro (EDSM 2008-2025) envisions innovation in the energy sector, planning for future reliable energy supply, more efficient use of energy and the promotion of renewable energy sources. Technological innovations in efficient energy consumption need to become one of the basic programmes in the industrial sector (EDSM, Section 10.9). The use of energy labels may help to increase the scope of research and technological innovation in industry. Energy labelling for buildings will, in addition to heating regulations, contribute to technological development in the areas of insulation techniques and installations in construction. The strategy is accompanied by the Energy Development Plan for the 2008-2012 period.

**Energy Efficiency Strategy and the Small Hydro Power Development Strategy**

The Energy Efficiency Strategy stipulates establishing an institutional mechanism (Energy Efficiency Fund), which would provide resources for EE projects and programmes. The fund will also promote projects and measures for renewable energy sources development in Montenegro. The strategy is accompanied by the Energy Efficiency Plan for 2008-2012. The Small Hydro Power Development Strategy was adopted in 2006. It sets a target of 15 to 20 MW of new generating capacity from small hydro-power resources by 2015.

**Energy Policy**

The Energy Policy of Montenegro identifies goals and objectives, as well as the instruments aimed at developing the energy sector that would secure reliable power supply, environmental protection, ownership, market operation, investments, energy efficiency, new renewable resources, regional and broader integration, social protection measures, and more. In line with the economic development of Montenegro, and with EU legislation, the Energy Policy outlines the need to establish an adequate legal, institutional, financial and regulatory framework for sustainable energy sector development.

**Energy Law**

The Energy Law defines the basic principles for the implementation of the energy strategy and energy policy in Montenegro. Renewable energy and energy efficiency are covered in Chapter VII. However, the law is lacking specific provisions for supporting RE and EE projects. Adequate (secondary) legislation on promoting EE and RE and energy labelling is still lacking. However, within the framework of the “2009, Year of Energy Efficiency” the work on primary and secondary legislation has begun.

As a result in September 2009, the Government of Montenegro passed the Decree for Wind Power Plants. The document regulates the entire process of the measuring and exploration of wind potential, the leasing of land for this purpose, the construction of wind power plants and their connection to the grid, as well as the purchase of the electricity produced.

**Draft Energy Efficiency Law**

The draft Energy Efficiency Law, which is to be passed soon, has a provision for establishing the Energy Efficiency Fund and an institution that would take a lead on energy efficiency activities. The law will also reflect key provision of Directive 2006/32/EC. The ongoing activities for strengthening the capacities of the Energy Efficiency Unit within the Ministry for Economic Development will continue during this period. The activities of gradual adaptation and development of the legislative, regulatory and institutional framework for energy efficient buildings should start soon. For that purpose, it is planned that the concepts and provisions on energy efficiency will be introduced as amendments to the existing Law on the Construction of Buildings (according to Directive 2002/91/EC).
Law on Integrated Pollution Prevention and Control

Although the law was adopted in 2005, its application started only at the beginning of 2008. During 2007, the following decrees were adopted:

- Decree on types of activities and installations for which an integrated permit is issued;
- Decree on criteria for determining best available techniques for the application of quality standards, as well as for determining emission limit values in the integrated permit;
- Decree on the content of the programme of measures for adjustment to prescribed requirements of the operation of existing installation or activities.

According to Article 31 of the Law on IPPC, operators have a transition period for obtaining an IPPC permit until January 1, 2015. This is seen as a driver of eco-innovation and of the implementation of eco-technologies in the domain of cleaner production and energy efficiency.

Strategic Master Plan for Waste Management

The Strategic Master Plan for Waste Management envisages the construction of seven regional sanitary landfills for the entire territory of Montenegro. At the beginning of 2008, there was only one landfill in Montenegro where waste collected from territories of the local self-government units of Podgorica and Danilovgrad were disposed of properly. There are plans for the remaining six envisioned regional sanitary landfills to be constructed and for six inter-municipal enterprises to be established for managing these landfills. The projects for these regional landfills have recycling components. Activities on the construction of a regional recycling centre on the existing landfill in Podgorica are ongoing, with a capacity of 90,000 tons per year of unselected communal waste.

Waste Management Law

The Law on Waste Management was adopted in 2005, but its implementation started only in November 2008. The law envisioned the obligation for enterprises and institutions to devise waste management plans. The transition period for this is three years (starting from November 2009). The need to prepare waste management plans will have an implication on providing more business opportunities for eco-industries and consulting companies in developing such plans and introducing eco-technological measures for a wide variety of clients.

Law on Environmental Protection

The Law on Environmental Protection (Sl. List Crne Gore, bb. 51/08), adopted in 2008, stipulates the establishment of the Regulatory Environmental Protection Agency. Additionally, this law defines provisions for the transposition of the EMAS Regulation (Regulation 761/2001 of the European Parliament and of the Council allowing Voluntary Participation by Organizations in a Community Eco-management and Audit Scheme), the Seveso II Directive (31996L0082 on the Control of Major-Accident Hazards Involving Dangerous Substances) and Eco-label Regulation (Regulation 1980/2000 of the European Parliament and of the Council on a Revised Community Eco-label Award Scheme). Secondary regulations are expected to be adopted during 2009 (2nd/3rd quarter) and harmonised with EU legislation and standards.

Institutions and stakeholders

Scientific research and innovation are supported through the Ministry of Science and Education. Section 3 of the National Innovation and Research Policy describes the institutional framework for the development of scientific research. In terms of the use of renewable sources of energy and improving energy efficiency, as explained above, Montenegro is obliged through the ECSEE Treaty, to respect European norms. Therefore the use of renewable energy sources has to be regulated by law, especially the use of hydro-power through the strong promotion of small hydro-power plants. It also stipulates opening the electricity market and allowing access to the electricity network by third parties. This means that entrepreneurs and enterprises, both foreign and domestic, can apply for concessions and licences to provide public services (Law on the Participation of the Private Sector in Providing Public Services, (OG 30/2002) that is, to produce energy and sell it to the network.

Currently, the key actors participating in the process of approving and licensing such projects are:

- the Government of the Republic of Montenegro;
- the Ministry of Tourism and Environmental Protection;
- the Ministry of Economic Development;
- the Ministry of Agriculture, Forestry and Water Management;
- the Regulatory Energy Agency;
- the Electric Power Company of Montenegro (EPCG, also the network operator); and
- authorised bodies of local governments.
Energy Regulatory Agency

The main role in this process is played by the Energy Regulatory Agency, which, in compliance with the Energy Law, provides licences, sets prices and performs other regulatory functions in this field. It is worth mentioning that participation by Montenegro in the Clean Development Mechanism under the Kyoto Protocol can also encourage innovation in this sector since quite a large number of CDM projects are implemented in the energy supply and demand sector.

Ministry of Economic Development,
Energy Efficiency Unit

In accordance with the Energy Efficiency Strategy, the Energy Efficiency Unit within the Ministry of Economic Development is taking steps to develop into an energy efficiency agency or a body with a similar status in order to play a leading role. So far, the unit is applying projects in EE in the public sector only.

Institutions relevant for recycling, cleaner production and IPPC

For the time being, competent bodies in charge of issuing permits in accordance with the Law on Integrated Pollution Prevention and Control are:

- the Ministry of Tourism and Environmental Protection — larger installations; and
- the local administration in charge of environmental protection affairs — smaller installations.

The Agency for Environment Protection, which is to be established according to the new Law on Environment Protection, will take over regulatory roles in this field.

Cleaner production in the agricultural sector is promoted through the valorising of organic farming, while in the tourism sector — an important sector of the Montenegrin economy — there is a strong commitment to a strategic approach to sustainable solutions.

Recycling is elaborated through the Waste Management Master Plan and Waste Management Act. According to those documents, local authorities in charge of the management of municipal waste are obliged to provide for selective waste collection and waste disposal on sanitary landfills as a starting point for implementing the Recycling Strategy. An owner of electronic waste is obliged by the Waste Management Act to organise its recycling.

Serbia

Serbia’s process of transition from a planned to a market-based economy started in 2001 following a drop in production during and after the Balkan wars of the 1990s. A restructured financial sector, a budget surplus and a stable exchange rate of the dinar, Serbia’s national currency, all demonstrate successful stabilisation policies (EC, 2009). The short-term economic outlook for Serbia remains positive, but the restructuring of enterprises and unemployment remain major challenges.

The preservation of macro-economic stability provided the basis for fast economic growth and a strong increase in personal income. GDP grew at an average annual rate of 5 percent between 2001 and 2008 and was equal to USD 7,070 in 2008, which defines Serbia as a middle-income country (EC, 2009). During the same period, the poverty rate fell from 14 percent of the population to about 6.6 percent. The rapid expansion of domestic credit in recent years has stimulated a consumer boom and a high demand for imports and has resulted in a large account deficit amounting to 17 percent of GDP, despite continual growth in exports. Due to targeted central bank policy to curb inflation, it was possible to slow down its rate from 90 percent in 2001 to below 9 percent in 2008 (EC, 2009).

Nevertheless, a robust growth in exports accounted for only 50 percent of total imports, and the trade account deficit remained at above 20 percent of GDP as a consequence. Otherwise, strong financial inflow in the form of remittances from abroad, foreign loans and foreign direct investments have led to a balance of payments and rise of foreign exchange reserves at the National Bank (EC, 2009). FDI were on average 7 percent of GDP in recent years, positioning Serbia within one of the top countries in the SEE region able to attract such investments, but green investment is still rare (EBRD, 2009).

The first stage of reforms is well advanced: Banking sector privatisation was completed, and an approximately 70 percent share of the sector belongs to foreign investors. Restructuring of state-owned enterprises is continuing, although several large enterprises still remain state controlled and progress in privatisation efforts is very slow. As a result, the private sector’s share in economic activity is lower than 55 percent as a result (EC, 2009). Over 26 percent of the population employed in Serbia work for publicly owned enterprises or the government, which places a substantial burden on the economy through significant fiscal and non-fiscal subsidies.

Serbia’s high rate of economic growth will be affected in the short term by the global financial crisis. Continuing political stability will likely guarantee strong interest by
foreign investors in the future due to major privatisation and restructuring projects planned for coming years and particularly due to the country’s favourable geographical position, which makes it a connection point to other countries of the region (EBRD, 2009).

Relevant strategic, planning and legal documents

Strategy (2008-2013) and Action Plan (2009) for Competitive and Innovative SMEs

The Strategy for Competitive and Innovative SMEs prepared by the Ministry of Economy and Regional Development (MoERD) was adopted in October 2008, with the aim of creating a supportive and efficient environment for SMEs. The strategy is harmonised completely with the EC’s Small Businesses Act for Europe. It envisages start-up loans, education and training for SMEs, the development of multiple funding sources for SMEs, and completion of the necessary institutional, legal and business framework for SMEs. The strategy will facilitate the transformation of micro enterprises into SMEs; make possible the creation of new SMEs; encourage quicker growth in SMEs’ first years of operation; increase exports; and facilitate more balanced regional development. The Action Plan for 2009 was adopted in February 2009 and elaborates necessary legislation and taxation updates which should be carried out during 2009, as well as financing activities from national and foreign sources.

Draft National Sustainable Development Strategy

According to the Draft National Sustainable Development Strategy (NSDS), one of the most important national priorities in relation to the sustainable development of Serbia is the protection of the environment and the rational use of natural resources. This encompasses investing in reduced pollution of the environment and in the development of cleaner technologies; reducing the high energy intensity of the Serbian economy and providing for more efficient use of fossil fuels; and promoting the use of renewable energy sources.

The current level of utilisation of renewable energy sources is very low, with the exception of the use of major watercourses in hydro-power plants (HPP), as costs associated with the use of renewable energy sources are significantly higher than those associated with conventional energy sources. The energy potential of renewable sources of energy in Serbia is about 25 percent of annual consumption of primary energy. The biomass potential is somewhere between 63 and 80 percent of total renewable energy potential. There is also potential in existing geothermal springs, wind energy and solar energy, but biomass energy is estimated as having the country’s greatest renewable energy potential.

The problems in using renewable energy identified in the strategy are: bad spatial distribution of water, inadequate infrastructure for the use of renewable energy sources; incomplete legislative framework for promoting the use of renewable energy sources; lack of reliable data regarding the potential of renewable energy sources; and

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**TABLE 6: Macro-economic indicators for Serbia**

<table>
<thead>
<tr>
<th></th>
<th>2004</th>
<th>2005</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
</tr>
</thead>
<tbody>
<tr>
<td>GDP (in billion USD)</td>
<td>23.8</td>
<td>25.4</td>
<td>29.7</td>
<td>39.9</td>
<td>52.2</td>
</tr>
<tr>
<td>GDP growth (%)</td>
<td>8.4</td>
<td>6.2</td>
<td>5.7</td>
<td>7.5</td>
<td>5.0</td>
</tr>
<tr>
<td>GDP per capita (in USD)</td>
<td>3285</td>
<td>3585</td>
<td>4140</td>
<td>5440</td>
<td>7070</td>
</tr>
<tr>
<td>Inflation (%)</td>
<td>13.7</td>
<td>15.6</td>
<td>11.1</td>
<td>10.1</td>
<td>8.6</td>
</tr>
<tr>
<td>Unemployment (%)</td>
<td>31.5</td>
<td>32.6</td>
<td>33.3</td>
<td>33.9</td>
<td>30.0</td>
</tr>
<tr>
<td>Exports (% of GDP)</td>
<td>22.7</td>
<td>25.1</td>
<td>27.1</td>
<td>21.8</td>
<td>22.2</td>
</tr>
<tr>
<td>Imports (% of GDP)</td>
<td>48.4</td>
<td>45.2</td>
<td>46.9</td>
<td>43.4</td>
<td>44.0</td>
</tr>
<tr>
<td>Current account balance (% of GDP)</td>
<td>-11.7</td>
<td>-8.5</td>
<td>-13.1</td>
<td>-17.2</td>
<td>-18.6</td>
</tr>
<tr>
<td>Budget surplus/deficit (% of GDP)</td>
<td>0.9</td>
<td>1.9</td>
<td>1.5</td>
<td>1.3</td>
<td>-0.6</td>
</tr>
<tr>
<td>Gross foreign debt (% of GDP)</td>
<td>52.5</td>
<td>62.0</td>
<td>61.4</td>
<td>64.3</td>
<td>63.3</td>
</tr>
<tr>
<td>Foreign direct investment (% of GDP)</td>
<td>3.9</td>
<td>5.9</td>
<td>5.2</td>
<td>5.5</td>
<td>13.8</td>
</tr>
</tbody>
</table>

the lack of an efficient system of financial incentive instruments aimed at mass use of renewable energy sources.

The relevant sectoral objectives of the strategy are to:

- intensify research into the potential of renewable energy sources for the purpose of their verification and the identification of realistic balances;
- identify technologies that would justify the implementation of incentives and undertake a comparative analysis of possible incentive measures;
- adopt regulations for promoting the use of renewable energy sources (tax incentives, stimulus prices of energy from renewable sources); and
- increase the level of use of renewable energy sources.

**National Environmental Protection Programme (NEAP)**

The National Environmental Protection Programme (NEAP) is created for a period of 10 years with a view to developing modern environmental policies in Serbia. The NEAP is followed by action plans, which are detailed plans for implementing this programme in the next five years. The programme is also in accordance with the Serbian EU accession. The main goals of the NEAP, relevant for eco-innovation, are those related to waste management:

- the harmonisation of national regulations with EU legislation;
- the development of regional waste management plans;
- the promotion of waste use as an alternative fuel;
- the remediation of existing dumpsites that pose one of the biggest threats to the environment; and
- the strengthening of professional and institutional capacities in hazardous waste management.

**Draft Cleaner Production Strategy**

The Ministry of Environmental Protection and the Faculty of Technology and Metallurgy in Belgrade completed the draft of the Cleaner Production Strategy in Serbia. This strategy should influence Serbian industry to introduce cleaner technologies. Companies which apply cleaner technologies will save money through reduced spending, improved operations in terms of raw material treatment, reduced spending on waste disposal, greater energy efficiency, and reduced environmental pollution. This strategy provides an operative elaboration of the sustainable development strategy of Serbia, as related to production processes, products and services, with the aim of increasing overall efficiency and reducing risks to human health and the environment. The proposal of the strategy has been sent to the government for approval.

**Law on Environmental Protection**

This framework Law on Environmental Protection (2004) regulates the integral system of environmental protection aimed at ensuring the human right to live and develop in a healthy environment, as well as balanced economic growth and the protection of the environment in Serbia. This law anticipates incentives for the application of technologies that are environmentally friendlier than others, and also technologies that use renewable energy. This includes exemptions on taxes, customs and other duties, provided under the terms and conditions of a special law (the Law on Tariffs), for recycling activities and other activities that reduce negative environmental impacts.

Chapter VI refers to economic instruments. In accordance with this law, the Fund for Environmental Protection shall be established, and both budgetary financing and international financial assistance (from international organisations, financial institutions and bodies) shall be carried out within the activities of the fund. The fund shall carry out activities in relation to financing the prepayment and development of programmes, projects and other activities in the area of the preservation, sustainable use, protection and advancement of the environment, as well as in the area of energy efficiency and use of renewable energy sources. The fund should keep a database on programmes, projects and other activities in the area of environmental protection and energy efficiency, as well as on necessary and available financial means for their realisation. This fund is also responsible for the establishment and realisation of cooperation with international and domestic financial institutions and other legal and natural entities in order to finance environmental protection and energy efficiency in accordance with the national programme and other strategic plans and programmes and concluded international agreements for the purposes determined by this law.

The revenues of the fund shall be realised on the basis of international bilateral and multilateral cooperation on programmes, projects and other activities in the area of environmental protection and energy efficiency. The fund’s finances shall be used for financing action and rehabilitation plans in accordance with the national programme, and in relation to eco-innovations: recycling and waste reuse; incentives for cleaner production and the application of best available techniques for the operation of the facility and activity performance; technology which
reduces pollution of the environment; incentives for the use of renewable energy sources and increased energy efficiency; and incentives for sustainable economic activities, namely sustainable economic development.

**Law on Integrated Environmental Pollution Prevention and Control**

The IPPC Law (2004) provides indirect incentives for developing and applying technologies for cleaner production and recycling. This law regulates the conditions and procedures for granting integrated permits for installations and activities that may have adverse effects on human health, the environment or material resources, types of activities and installations; supervision and other issues that are of relevance to environmental pollution prevention and control.

This law defines the conditions for applying for an integrated permit. Among other documents that must be submitted with the application are documents proving that the best available techniques are implemented or planned to be implemented by the operator of a new or existing installation in order to prevent or reduce pollution. The operator should also ensure that the proposed technology will include measures for efficient energy consumption, and the applicant should also submit the plan of measures for efficient energy consumption. The IPPC permit has to contain conditions relating to the implementation of the best available techniques or other technical requirements and measures, and also measures relating to efficient energy consumption.


Serbia has the potential to produce 4.3 million tons of oil equivalent annually from RES, 63 percent of which could be obtained from biomass, 14 percent from hydropower, 14 percent from solar energy, 5 percent from wind energy, and 4 percent from biothermal sources. The priority of the Energy Sector Development Strategy of the Republic of Serbia is the rational use of quality energy sources through increasing efficiency in energy production, distribution, and use. The Energy Sector Development Strategy recommends measures and instruments up to 2015 for achieving this goal. The strategy envisages the preparation of new harmonised technical legal acts, bylaws, and standards for energy technologies/activities and the constitution of special instruments for stimulating activities for the rational and efficient use of energy, including formation of a body for tracking and controlling the processes of energy sector reform.

The strategy stipulates the instigation of strategic initiatives in the domain of investments in new energy sources, technologies and energy-efficient appliances, equipment, measures for financing incentives for private investments in economically effective programmes, projects for energy efficiency and the selective use of new renewable energy sources, including measures for establishing a national fund for such programmes and projects.

According to our survey and interviews in 2008 and 2009, the Energy Sector Development Strategy does not put enough emphasis on energy efficiency and renewable energy, and it should be updated. At the time this study was finalised (December 2009), the Government of Serbia had adopted changes to the strategy focusing on a shorter period (up to 2012), which call for reducing greenhouse gas emissions and fossil fuel imports and creating jobs in the energy sector. To achieve these goals, Serbia plans to draw EUR 200 million in investments for building renewable energy facilities with a total capacity of 100 megawatts (MW) by 2012; small hydro-power plants are to account for 45 MW of the total; wind energy facilities 45 MW; solar energy facilities 5 MW; biomass facilities 2 MW, and biogas facilities 5 MW. These changes to the strategy, together with the Decree on Feed-in Tariffs (see below) are expected to increase the output of electricity from renewable sources in 2012 by 7.4 percent, or 735 million kWh, compared to 2007.

Since 63 percent of the potential of renewable energy sources lies in biomass, it is surprising that the strategy update envisages only 5 percent for biomass in terms of new installations up to 2012. However, we assume that the next strategy update will put more emphasis on developing biomass installations.

**Energy Law**

The Energy Law (2004) regulates energy policy objectives and the method of its implementation; energy market organisation and functioning; conditions for regular and high-quality consumer energy supply and for ensuring safe, reliable and efficient energy production; the management of energy transmission, transportation and distribution systems and the method of securing the smooth functioning and development of these systems; conditions for and the method of carrying out energy activities; as well as energy efficiency and environmental protection conditions in carrying out energy activities.

In accordance with this law, the generation of electrical energy shall include production in hydro-electric power plants, thermal power plants, combined heat/electric power plants and renewable energy or waste electric
power plants. Those electrical power producers who in their electrical power generation process use renewable energy sources or waste; those who generate electrical power in electric power plants considered as small electric power plants; as well as those who simultaneously generate electrical power and heat, provided they meet energy efficiency criteria, shall become privileged electrical power producers.

The law stipulates forming a National Fund for Energy Efficiency, which has not yet been created. The law also defines the Serbian Energy Efficiency Agency (SEEA) as a special organisation for carrying out professional activities for improving conditions and measures for the rational use and saving of energy and energy sources, as well as increasing the efficiency of energy use within all sectors of energy consumption. The agency has existed since 2004; more information is available in the next section on institutions.

**Decree on Feed-in Tariffs**

The Decree on Feed-in Tariffs (2009) for electricity produced from renewable energy sources was enacted in December 2009. The feed-in tariffs will be available for all electricity produced at small hydro-electric power plants and other renewable energy facilities over 12 years from the start of production. Under the decree, the state power utility Elektroprivreda Srbije (EPS), which currently sells electricity in Serbia at about EUR 0.04 per kilowatt-hour (kWh), will pay EUR 0.078 to EUR 0.097 per kWh of electricity produced by small hydro-electric power plants with a limit on the size of the hydro plant to 10 MW; EUR 0.114 to EUR 0.136 per kWh of electricity from biomass; EUR 0.12 to EUR 0.16 per kWh of electricity from biogas; and EUR 0.095 per kWh of electricity from wind energy with a limit of installed capacity of 450MW. EPS will also buy electricity from producers using sewer and landfill gas at EUR 0.067 per kWh; geothermal energy companies at EUR 0.075, co-generation plants at EUR 0.076 to EUR 0.104; and waste-fired plants at EUR 0.085 to EUR 0.092. The highest rate will be paid for electricity from solar energy at EUR 0.23 per kWh with a limit of installed capacity of 5 MW.

**Draft Law on the Rational Use of Energy**

The Law on the Rational Use of Energy is in the preparatory phase and is being drafted by a working group that consists of MoME, MoESP, and SEEA. However, the draft has not yet been submitted for public comment.

**Draft Waste Management Law**

The main aim of the Waste Management Law relevant for eco-innovation and technology is to provide the conditions for waste separation, reuse, recycling and the reuse of waste as an energy source. Producers have the obligation to use technologies and develop production in a way that ensures the rational use of natural resources, materials and energy; to instigate the reuse and recycling of products and packaging; and, at the end of the lifecycle, to promote the ecologically sustainable management of natural resources. Electric and electronic waste management is also defined by this law. In waste vehicle management, the person responsible for the treatment of waste vehicles must ensure the disposal of parts that cannot be recycled. When this law is adopted, the Recycling Agency of Serbia will no longer exist. All tasks, subjects, archives and other documentation of the Recycling Agency, plus all equipment and facilities, will be taken over by the MoESP. The Law on Packaging and Packaging Waste is also in the drafting phase and will provide incentives for eco-innovation and the application of eco-technologies in the fields of packaging and packaging waste minimisation.

**Institutions and stakeholders**

**Ministry of Environmental Protection and Spatial Planning**

The Ministry of Environmental Protection and Spatial Planning (MoESP) is responsible for developing and maintaining the system for the protection and sustainable use of natural resources, and for producing relevant strategic documents, plans and programmes. Currently it does not have a major role in supporting and financing eco-innovation projects. The support is limited to providing technical assistance for waste management projects, some of which do have a recycling component.

**Fund for Environmental Protection**

In Serbia, one of the main domestic sources of financing environmental protection is the Fund for Environmental Protection (FEP). The scope of the fund covers the development and implementation of programmes and projects in the field of environmental protection, sustainable use of natural resources, environmental infrastructure, energy efficiency and renewable energy (FEP, Institutional Profile, 2008). In practice, the FEP mostly finances projects in the waste sector (and some in the air sector) while water sector projects are funded by the Water Directorate (WD), under the Ministry of Agriculture, Forestry and Water Management (MAFWM).
Since 2006, the FEP has been allocating grants for project documentation preparation related to the sanitation, recultivation and closure of existing landfills. Since 2007, there has been financing of the actual construction of regional landfills, some of which contain a recycling centre component. In 2007, the Serbian FEP disbursed a total of EUR 2 million entirely for the waste sector directed to the preparation of the project documentation and the actual construction of the first phase of the regional waste landfill in Prokuplje and the sanitation of seven municipal landfills. For 2008, the Serbian FEP disbursed EUR 17.4 million in total. Of that sum, EUR 9.4 million (54 percent) is dedicated to the waste sector. For the air protection sector, a total of EUR 0.77 million (13.5 percent) is allocated. In 2009, the Serbian FEP secured a total of EUR 15 million, entirely for the waste sector (REC, PEIP Serbia Analytical Report 2009).

The FEP will change its structure once the new Law on FEP is adopted. The revenues of the fund currently include revenues from nature and resource use; pollution charges; a portion of funds resulting from privatisation; funds from multilateral and bilateral programmes, projects and other activities in the field of environmental protection and energy efficiency; reinvested income and revenues of the fund; and contributions, donations and grants. Fund assets are granted through loans, guarantees, direct grants and interest rate subsidies on commercial loans (FEP, Institutional Profile, 2008). Currently, 70 to 80 percent of funds are allocated through grants. The share of loans is planned to increase in future. In 2006, the amount from charges directed to the fund was about 0.02 percent of GDP, so it is evident that with the current low revenues from charges, the FEP is not able to provide a significant amount of money or support to projects eligible for financing, such as those on environmental protection, energy efficiency and renewable energy.

Ministry of Science

The Ministry of Science is responsible for supporting science and technological development. The ministry’s Department for Technological Development, Transfer of Technologies and Innovation Systems coordinates development solutions in several fields, including energy technology, renewable energy, and energy efficiency in particular. The ministry has carried out the National Energy Efficiency Programme (NEEP 2001-2009) that had the aim of stimulating research and technology development projects in the field of renewable energy and energy efficiency. Between 2002 and 2008, the NEEP distributed around EUR 2 million per year for national energy studies, including potentials for EE and RE, as well as RDD projects including RE pilot plants and feasibility studies for such projects.

Ministry of Economy and Regional Development and the Agency for SMEs

The Agency for SMEs and Entrepreneurship was established according to the Law on the Agency for the Development of Small- and Medium-Sized Enterprises (Official Gazette of RS, No. 65, 11/23/2001) within the Ministry of Economy and Regional Development (MoERD). The agency was established with the primary aim of supporting the interests and development of the SME sector, which should contribute to balancing the economic structure, accelerating economic development and reviving economic flow in the country. The agency supports the creation of an environment enabling the growth and development of SMEs. It directs non-financial support to the SME sector (i.e. consulting, information, connectivity, and facilitating access to funding sources); prepares and implements educational programmes for entrepreneurs and managers of SMEs; coordinates the national network of regional agencies and centres; assists SMEs in the field of new technologies; and supports SMEs’ innovative activities by creating links between the R&D sector, universities and SME sector.

Cleaner Production Centre of Serbia

The Cleaner Production Centre of Serbia (CPCS) was established in 2007 in the Faculty of Technology and Metallurgy in Belgrade (within the scope of a UNIDO project). The CPCS’s Advisory Board members are high-level representatives of the Ministry of Environment and Spatial Planning, the Ministry of Mining and Energy, the Ministry of Finance, the Ministry of Economy and Regional Development, the Office of the Deputy Prime Minister of the Government, the OSCE Mission in Serbia, the University of Belgrade, and the Serbian Chamber of Commerce.

The CPCS mission is to promote the cleaner production concept in Serbian companies; to raise awareness of the importance of sustainable development and cleaner production as a way of achieving that goal; and to increase capacities for the introduction of cleaner production in national industry. The aim of the CPCS is to provide a wide range of services related to cleaner production, integrated pollution prevention, waste management, and chemical management.

Since 2008, the CPCS has organised trainings for engineers from different sectors in order to become advisers.
on cleaner production; those who successfully complete the course receive UNIDO certification. At the moment, there are 38 such advisers in Serbia. The CPCS is also providing programmes for companies to introduce systems for cleaner production. In 2008, eight companies successfully introduced the system for cleaner production in their units, while 11 companies applied for the same programme in 2009.

Serbian Energy Efficiency Agency

The Serbian Energy Efficiency Agency (SEEA) carries out activities related to drafting proposals for incentive measures aimed at enhancing energy efficiency in the drafting of the Energy Development Strategy; drafting and proposing programmes and measures for stimulating rational and efficient energy use and monitoring their implementation; drafting proposals for implementing energy efficiency; the exploitation of renewable energy sources and environmental protection; drafting and proposing technical and other regulations for increasing energy efficiency; drafting criteria for the evaluation of equipment efficiency and methods for bringing them into line with adequate international regulations and standards; providing financial and technical support in the preparation and implementation of priority energy efficiency projects; and consultative, advisory (technical assistance) and educational activities (trainings, seminars) in promoting energy efficiency, renewable energy sources and co-generation.

Technical assistance provided by the SEEA includes drafting projects, regulations and programmes; and organising training and workshops in accordance with the Energy Sector Development Strategy. The SEEA currently covers all segments of the energy efficiency sector (excepting energy efficiency within the transport sector). The SEEA cooperates with four regional energy efficiency centres in Novi Sad, Kragujevac, Nis and Belgrade. The financial sources included thus far are the national budget; the EU through the European Agency for Reconstruction; IFI loans and grants from the WB, EBRD and KfW; bilateral grants from individual countries; and, in some cases, commercial loans.

Institutes, associations and NGOs

Energy Efficiency Committee

The Energy Efficiency Committee (EEC) within the Standing Conference of Towns and Municipalities (SKGO) deals with problems related to energy efficiency and renewable energy sources in municipalities. The EEC assists municipalities by providing advice and by connecting them with ongoing energy efficiency programmes and projects offered by foreign institutions. The EEC also provides comments and suggestions on draft laws, by-laws and regulations in the field of communal energy efficiency.

Serbian Chamber of Commerce and Industry

According to interviews with recycling company representatives, the Serbian Chamber of Commerce and Industry has good communication and constant cooperation with recycling companies and organises meetings, workshops and seminars. The main objectives of the meetings, which assemble representatives of the recycling sector, are to promote and facilitate international cooperation, and to facilitate contacts and communication between companies, ministries, agencies and other relevant institutions and stakeholders.

The Serbian Chamber of Commerce and Industry provides incentives to companies that aim to improve their business by introducing measures in accordance with environmental protection principles in the form of annual awards for social responsibility, and other measures. Companies that are recognised by the chamber as active in the recycling domain receive opportunities to improve their business through facilitating contacts with other companies and institutions. The chamber also facilitates participation in relevant domestic and international fairs for most proactive companies.

Belgrade Chamber of Commerce

The Belgrade Chamber of Commerce has three units that are relevant for eco-innovation: the Association of Industry; the Department for Technology Development and Transfer; and the Department for Environment.

The Association of Industry in the Belgrade Chamber of Commerce facilitates business connections and the development of cooperative relations with domestic and international partners in accordance with increasing competitor ability and profitability; provides support to members in programme restructuring; and supports and implements projects and programmes for introducing new technologies and for providing international direct investments for that purpose. The Association of Industry also assists companies in the implementation of programmes for energy efficiency and the revitalisation of energy substations and equipment. It also contributes to making connections between SMEs and relevant research institutions.

The Department for Technology Development and Transfer is active in the field of cooperation with scientific, expert institutions and researchers in the area of technical and technological development and restructur-
ing. It initiates and participates in the realisation of technology parks, innovative centres and pilot projects of interest for the Belgrade area. The department instigates research and design in industry and for industry by providing prizes. It is also responsible for updating the database of inventions and innovative solutions.

The Department for Environment has an obligation to inform economic entities about their environmental obligations in accordance with new laws that are harmonised with EU legislation; to organise expert meetings, seminars and workshops related to environmental protection issues; for work on projects related to environmental protection that are of interest to members of the chamber; and to stimulate the solving of actual environmental problems.

Recan Fund for the Recovery and Recycling of Beverage Cans

The Recan Fund was set up in 2004. The company is a subsidiary of the beverage can producer Ball Packaging Europe, which has a regional production facility located in Serbia. Currently Recan has recycling centres in Poland, Serbia and Germany. These recycling centres are regional points for collecting used beverage cans, checking quality (only aluminium cans are accepted), baling the cans and sending them to one of the two smelters (in the United Kingdom and Germany) owned by the company. The company is planning to increase the number of recycling centres for beverage cans in the future. The recycling centres cooperate with waste management companies, local scrap metal dealers, supermarkets, shopping centres, petrol stations and other local facilities. The aim is to provide a network of collection points to ensure that consumers have easy access to a convenient and problem-free facility to which to return used beverage cans.
Chapter 2

International Funding Mechanisms

European Bank for Reconstruction and Development

In the studied countries EBRD activities relevant for financing eco-innovation are divided into financing SMEs and financing the sustainable energy sector. The EBRD is promoting sustainable energy technical assistance projects, risk capital for wind development projects, carbon finance (facilitating the development and sale of carbon credits on a project-by-project basis) and the co-financing of renewable energy funds.

Western Balkans and Croatia Financing Framework for SMEs

The EBRD financing framework for SMEs builds on the positive experience of the existing Western Balkans SME Finance Facility and MSME Financing Framework for the Western Balkans and Croatia. It is a multi-client, multi-product framework facility for an aggregate amount of EUR 250 million. Under the proposed facility, the EBRD will provide its partner financial institutions in Albania, Bosnia and Herzegovina, Croatia, the former Yugoslav Republic of Macedonia, Kosovo (as defined under UNSCR 1244), Montenegro and Serbia a full range of financial products including mortgage financing, MSME credit lines, consumer finance, leasing finance, guarantee facilities, syndicated loans, subordinated debt and equity investments. Further improvements in operational efficiency and the increased amount of financing made available by the EBRD are expected to increase competition, thus contributing to greater efficiency, innovation and customer orientation in the financial sectors of the region. In the context of this study, this framework is particularly useful for small enterprises interested in pre-commercialisation and medium-sized enterprises interested in the full commercialisation of new green technologies.

West Balkans Sustainable Energy Direct Financing Facility

The EBRD West Balkans Sustainable Energy Direct Financing Facility (WeBSEDFF) is a direct financing facility for renewable energy projects and industrial energy efficiency projects. It is available for Albania, Bosnia and Herzegovina, Croatia, Kosovo (under UNSCR 1244), the former Yugoslav Republic of Macedonia, Montenegro and Serbia. The total amount available for this facility is EUR 50 million of loan funds, plus up to EUR 13 million in technical assistance and incentive payments for successful investments. Technical cooperation (TC) for the preparation of selected projects as well as the verification of projects will be provided by one German, one Croatian and two regional consulting companies chosen by the EBRD.

The projects will be financed through senior loans and project financing arrangements ranging from EUR 1 million to EUR 6 million with the average expected maturity of six to eight years for energy efficiency, and 10 to 12 years for renewable energy projects, with appropriate grace periods and flexible repayment schedules. The loans will be supported by TC funds for project identification and preparation as well as by incentive payments based on the estimated CO2 emission reductions generated by each eligible project.

The WeBSEDFF will be accompanied by an additional institutional capacity-building component of up to EUR 2 million (to be launched in 2010), in order to address deficiencies in the regulatory framework and other obstacles to the development of the market for sustainable energy projects. The WeBSEDFF has two operational bases, one in Belgrade covering Serbia, Montenegro and the former Yugoslav Republic of Macedonia, and the second in Zagreb covering Croatia, Bosnia and Herzegovina and Albania.

The projects eligible for the WebSEDFF are:
- renewable energy projects (only greenfield projects up to 10 MW), preferably:
  - run-of-river hydro-power plants;
  - wind farms,
  - solar systems; and
  - biomass systems generating heat and electricity; and
- industrial energy efficiency projects;
— on-site co- or tri-generation;
— rehabilitation of boilers, compressed air systems and steam distribution systems;
— installation of chillers;
— installations for heat recovery from processes; and
— various other EE improvement measures or combinations of them.

Regarding technical criteria, the projects should create at least 20 percent of energy savings for industrial energy efficiency projects; and a minimum efficiency (utilisation) rate for renewable energy projects. Financial criteria include sound financial/economic structure and sufficient equity capital contributed to the project by the project proponent/sponsor.

In order to encourage local entrepreneurs to develop sustainable energy projects in a less than perfect market environment, the WebSEDF will offer incentive payments to eligible projects based on the CO2 emissions that each project will avoid. This mechanism is similar to CDM carbon credit transactions, but without generating actual carbon credits for the project sponsor or a third party.

**Western Balkans Sustainable Energy Credit Line Facility**

The Western Balkans Sustainable Energy Credit Line Facility (WebSECLF) is applicable for Bosnia and Herzegovina, the former Yugoslav Republic of Macedonia, Montenegro and Serbia. It is a EUR 60 million credit line available through local banks to help SMEs invest in energy efficiency and renewable energy projects worth up to EUR 2 million. The facility is available for the following types of projects:

- industrial energy projects (EE, RE and co-generation);
- renewable energy projects; and
- building sector EE projects.

Thanks to additional EU grant money, the following incentives are available in order to encourage SMEs to use WebSECLF funds. Firstly, cash-back partial reimbursements on investments in boilers and small co-generation/tri-generation facilities (20 percent); all eligible EE investments (15 percent); investments in the energy efficiency of commercial buildings (20 percent); and investments in RE (20 percent, or 10 percent where feed-in tariffs are available). Secondly, a team of technical experts chosen by the vEBRD is available to assist companies and the on-lending banks in order to: determine project eligibility and, if applicable, whether there might be better options; to prepare an energy audit and project cash flow analysis; to assess the creditworthiness of the project; and to prepare business plans. The WebSECLF technical support project is financed by the Western Balkans Fund.

To date, WebSECLF funds have been successfully used by Serbia where four sustainable energy projects were approved with a total loan amount of around EUR 4 million, and BiH where four sustainable energy projects were approved with a total loan amount of around EUR 900,000.

**European Investment Bank (EIB)**

The European Investment Bank (EIB) mechanisms relevant to the purpose of our study are the European Investment Fund and the Risk Sharing Finance Facility which have the goal of improving access to finance SMEs and promoting renewable energy and activities on climate change through equity investments in venture capital funds.

**European Investment Fund**

The European Investment Fund (EIF) has the goal of transferring technological innovation from research laboratories and universities into the market, in the form of spin-out companies. The EIF does not provide funds directly to project proponents, but to venture capital funds which can decide where to invest this capital, on the condition that it is invested into energy efficiency and renewable energy projects smaller than EUR 10 million proposed by SMEs exclusively.

**Risk Sharing Finance Facility**

The EIB and EC jointly set up the Risk Sharing Finance Facility (RSFF) in order to improve access to debt financing for private companies or public institutions promoting activities in the field of research, technological development demonstration, and innovation investments. The RSFF is built on the principle of credit risk sharing between the EC and the EIB, which extends the ability of the bank to provide loans or guarantees with a low and sub-investment grade risk profile (involving financial risks above those normally accepted by investors). The EIB finances eligible and viable investments promoted by creditworthy counterparts established in EU member states and associated countries. All countries covered in this study are eligible for EIB funding.

The RSFF can support a wide range of research, technological development and demonstration and innovation (RTDI) activities, including basic (fundamental) research; applied or industrial research; experimental or pre-competitive development; definition stage or feasibility studies; and pilot/demonstration activities. The activi-
ties eligible for funding range from investments to equipment and soft investments such as R&D operating costs, salaries of researchers, management and support staff; utilities; consumables; acquisition or protection costs, and, under certain conditions, leasing and depreciation.

The RSFF mechanisms are designed to be flexible according to specific company or project types. Direct RSFF instruments include corporate debt financing, project financing and mezzanine financing, while intermediated financing instruments include risk sharing lines and guarantees. For the purposes of our study, project financing is the most important. Projects to be financed by the RSFF need to be technically, economically, financially and environmentally feasible according to the EIB’s project evaluation criteria. The maximum loan amount is 50 percent of eligible project cost, and the minimum loan amount is EUR 7.5 million, although smaller loans are also possible if handled by EIB partner banks acting as intermediaries. Most of the projects financed by the RSFF so far have been in the domain of renewable energy and energy efficiency.

**KfW**

The EBRD and EIB instruments described above are not applicable for small-scale projects. This gap is partly covered by KfW national onlending schemes through local banks, with loans available for smaller projects in the private sector. For example in Serbia, KfW signed a EUR 15 million credit line for small-scale RE and EE projects in SMEs with the local ProCredit Leasing bank. Regarding bigger (mostly public sector) projects, KfW is mostly investing in hydro-power projects, as well as energy efficiency projects in the sectors of district heating and water supply.

**South East Europe Energy Efficiency Fund**

Because of the above-mentioned gap in financing small-scale projects, the EBRD, EIB and KfW are, in cooperation with the EC, considering providing a joint equity investment of up to EUR 25 million in the South East Europe Energy Efficiency Fund (SE4F). The fund will provide senior, subordinated and mezzanine finance mainly through public and private banks to the EE sector in the pre-accession countries Croatia, Serbia, Bosnia and Herzegovina, Montenegro, the former Yugoslav Republic of Macedonia, Albania and Turkey. The aim will be to improve access to sustainable energy finance for small and simple energy efficiency investments, and to demonstrate the benefits of energy conservation and promote the expansion of energy efficiency and renewable energy lending in the not yet energy efficient economies of the target countries. The complementary nature of SE4F’s activities with existing EBRD facilities will result in a larger volume of sustainable energy financing available to the region, helping reach a sufficient mass to begin the long-term transformation of the lending market in this sector. The project is also expected to transfer and build additional skills related to sustainable energy investment among local banks, particularly in the area of assessing the risk and creditworthiness of clients for energy efficiency loans.

**Executive Agency for Competitiveness and Innovation (EACI)**

**Competitiveness and Innovation Framework Programme**

The Competitiveness and Innovation Framework Programme (CIP) supports innovation (including eco-innovation) activities of SMEs, better access to finance on the part of SMEs, business support services in the regions, and better take-up and use of information and communication technologies (ICT), and helps to develop the information society. It also promotes the increased use of renewable energies and energy efficiency. The total budget of CIP for 2007 to 2013 is EUR 3.6 million drawn from the European Investment Fund (EIF). These funds are distributed through three financial instruments: the Facility for High Growth and Innovative SMEs (GIF); the SME Guarantee Facility (SMEG); and Seed Capital Action (forthcoming).

The GIF provides risk capital for innovative SMEs in their early stages (10 to 25 percent of the total equity of the intermediary venture capital fund) and risk capital for SMEs with high growth potential in their expansion phase (7.5 to 15 percent of the total equity of the intermediary venture capital fund). The SMEG facility provides loan guarantees to SMEs with growth potential; microcredits to micro-enterprises and equity and quasi-equity guarantees for schemes that support small enterprises. The forthcoming Seed Capital Action will aim to reinforce the capacity of seed capital funds to invest in small businesses.

The main characteristic of the CIP is promoting cooperation between SMEs, government institutions and NGOs. As mentioned above, the co-financing of the projects is conditioned by cooperation on the project through the consortium. The permanent members of the consortium are the University of St. Cyril and Methodius in Skopje, the Foundation for Entrepreneurship and Management, the Macedonian Chamber of Commerce, and the Agency for Entrepreneurship and Competition.

The CIP encompasses three operational programmes:
• the Entrepreneurship and Innovation Programme (EIP);
• Intelligent Energy Europe (IEE); and
• the Information Communication Technologies Policy Support Programme (ICT PSP).

The first two operational programmes, EIP and IEE, are of interest for this study.

Entrepreneurship and Innovation Programme
The EIP provides EUR 433 million for the 2007-2013 period for financial instruments (EUR 228 million); pilot and market replication projects (EUR 195 million); and networks of national and regional actors (EUR 10 million). Applicants must have sufficient own sources of funding and proven technical and managerial skills. One specific segment of EIP is the Eco-innovation Initiative.

Eco-innovation Initiative
The Eco-innovation Initiative (EII) is part of the EIP. Through the eco-innovation funding scheme, the EU aims to support innovative products, services and technologies that can make better use of our natural resources and reduce Europe’s ecological footprint. With its objective to bridge the gap between research and the market, the CIP Eco-innovation Initiative contributes to the implementation of the Environmental Technologies Action Plan. In the context of our study, eligible countries are Croatia, the former Yugoslav Republic of Macedonia, Montenegro and Albania.

The eligible SMEs should have fewer than 250 people, with an annual turnover below or equal to EUR 50 million or an annual balance sheet below or equal to EUR 43 million. Eligible projects are required to prove their innovative character, potential for replication and marketability, and ability to significantly improve the general state of the environment; be beneficial to EU environmental policy objectives; demonstrate the technical and project management excellence of the team; and be cost-effective in producing a high-quality product. The projects must be from one of the following sectors: materials recycling, sustainable building construction, and/or efficient food and drink industrial processes.

The Eco-innovation Initiative provides around EUR 200 million for projects between 2008 and 2013. About 40 projects are in the pipeline to receive the first funds from the 2008 call, while the 2009 call is now closed and around 200 proposals have been received and will be evaluated by the end of January 2010. The next call for proposals is foreseen for April 2010.

Intelligent Energy Europe
The only country of interest for this study eligible for IEE is Croatia. To date, 27 projects with Croatian partners have been supported. The national contact point for IEE is in the Ministry of Economy, Labour and Entrepreneurship (Directorate for Energy and Mining) and the details are available on the Promoting Financing Mechanisms for Eco-Innovation website15.

In total, Intelligent Energy Europe provided EUR 65 million in the 2009 call. The 2010 call is not yet open but the submission deadline is expected to be in June 2010. The eligible projects should last at least three years, and there must be at least three different partners from three different countries (the EU-27, Croatia, Norway, Iceland and Liechtenstein are eligible). The call is open to any public or private organisation from eligible countries. The IEE can fund up to 75 percent of eligible project costs. Hardware-type investments and research and development projects are not supported under the IEE. Soft/supplementary types of activities are eligible:

- Energy efficiency and the rational use of energy:
  - training schemes for building workforce;
  - improving the energy efficiency of residential buildings; and
  - transforming the market for energy-efficient products.

- New and renewable energy sources:
  - renewable sources for electricity generation;
  - renewable sources for heating and cooling and bio-fuels; and
  - deployment of renewable energy sources in buildings.

- Energy use in transport:
  - alternative fuels and clean vehicles;
  - energy-efficient transport; and
  - know-how in local and regional agencies (sustainable mobility).

- Integrated initiatives:
  - sustainable energy communities;
  - support for bio-business (e.g. bio-mass, bioenergy);
  - energy services; and
  - intelligent energy education.
European Local Energy Assistance

The European Local Energy Assistance (ELENA) facility was set up by the EIB and the European Agency for Competitiveness and Innovation (EACI) for cities and regions investing in sustainable energy. This scheme can have indirect positive influence on green-tech companies providing services for such investments. Through the ELENA facility, operated by the EIB, the EC will provide funding of EUR 15 million in total. ELENA is funded by the IEE and will contribute to covering the technical assistance costs related to eligible investment projects or programmes.

Seventh Framework Programme for Research

All countries covered in this study are eligible for the Seventh Framework Programme for Research (FP7), which provides grants for individual projects proposed by either individual proponents or consortia. SMEs are especially encouraged to apply.

Research and technical development activities can be co-financed with up to 50 percent of eligible costs, and in the case of SMEs and research and education organisations with up to 75 percent. Demonstration activities can be co-financed with up to 50 percent (for all types of proponents), while consortium management, networking, training, coordination, and dissemination can be co-financed with up to 100 percent of eligible costs.

The overall budget for 2007-2013 is EUR 50 billion, spread across five components. Of these components, three are of interest: cooperation research projects (EUR 32 billion), the capacities programme (EUR 4 billion), and the fundamental research component (EUR 7.5 billion).

Open Regional Fund for Energy Efficiency in South East Europe

The German Cooperation Agency (GTZ) is operating the Open Regional Fund for Energy Efficiency in SEE countries on behalf of the German Federal Ministry for Economic Cooperation and Development (BMZ). All countries covered by this study are eligible for this fund — more specifically, their ministries for energy and other relevant sectors such as housing, environment, economy, etc. The fund will be operational until June 2011.

Apart from energy efficiency, the fund also supports renewable energies. The fund supports soft projects (technical assistance, experience exchange, training and information dissemination), as well as small-scale hard projects (small-scale EE and RE installations). The contacts of the fund and the country GTZ offices are available on the Promoting Financing Mechanisms for Eco-Innovation in SEE project website.
Chapter 3

Key Challenges and Barriers

This section features relevant literature about challenges and barriers in old and new EU member states that is relevant to the challenges and barriers in selected SEE countries identified during the background research survey, along with interviews and the conference discussions and conclusions. According to EC (2004), Kemp et al. (2004), Technopolis BV (2004), and Ashford (1993) the most common types of barriers to supporting and financing technological innovation in general, and eco-innovation in particular, are:

- insufficient/inadequate strategies (policies and plans), legislation and standards;
- inadequate institutional support for research and innovation;
- economic and financial barriers; and
- technological barriers.

This study is concerned with the first three types of barrier, while technological barriers will not be discussed further. All four types of barrier are interlinked, but the first two are inseparable, especially in SEE countries, where both institutions and policies/legislation are still being reformed in order to comply with the EU pre-accession requirements, as identified in the background study for this discussion paper (REC, 2008).

Strategic documents

The quality of relevant strategic documents depends to a large extent on the capacities of, and coordination between, institutions responsible for designing them. The three policy areas that are key for eco-innovation in the context of this study are science, research and innovation policy; environmental policy (including waste/recycling and cleaner production); energy policy (including renewable energy and energy efficiency); and policies relevant to the competitiveness and promotion of SMEs. Policies that can indirectly stimulate eco-innovation are those related to green public procurement (GPP) and to intellectual property rights (IPR).

As SEE countries are still in the transition period, the relevant ministries lack the technical cadre to provide steady support for developing the necessary strategies, policies and plans of sufficient quality. In the context of EU accession, Croatia is ahead in drafting, enacting and implementing relevant strategies. Montenegro and Serbia are making accelerated efforts to create all the necessary strategic and legislative documents in the area of sustainable energy. However, there is a general lack of coordination in preparing these policies. As identified in the Background Study on Financing Mechanisms for Eco-innovation in SEE (REC, 2008), the strategies, policies and plans in different sectors are often not coordinated regarding cross-cutting issues. Furthermore, there are frequent cases where lower-tier strategic documents are completed before the higher-tier ones. An additional problem is that drafted strategic document proposals often wait for a long time to be adopted, which in some cases makes them obsolete by the time of adoption. The same is true for legislation proposals.

Legislation

Even well-intended legislation and standards can act as barriers to implementing eco-innovation in production processes: unclear and unambitious legislation and standards do not provide sufficient drivers for developing and applying new green technologies (European Commission, 2004). On the other hand, too detailed and inflexible legislation and standards make it hard or impossible for companies to introduce appropriate new pollution reduction technologies in given timeframes. Well-designed legislation and accompanying standards do take into account the actual economic, financial and technological conditions in a given country and allow sufficient time for enterprises to introduce changes according to the above-mentioned conditions.

In our background study (REC, 2008), we identified that within the above-mentioned EU approximation efforts, all of the covered countries have adopted most of the relevant primary laws but only a negligible amount of the secondary legislation that is necessary to make the primary laws operational. The lack of secondary legislation
and standards aimed at internalising the costs of environmental pollution and the weak implementation of existing laws mean that most companies have no incentive to reduce their environmental impacts, increase their eco-efficiency and start introducing cleaner production measures. Market-based instruments need to be created or strengthened by adding relevant primary and secondary legislation that would stimulate investments in clean and energy-efficient technologies. Furthermore, state aid legislation should be tailored in such a way as to prevent bad subsidies, while supporting those that are favourable for eco-innovation.

An exception is Croatia, which has enacted sufficient secondary legislation and standards, especially in the sectors of renewable energy production and recycling, and created a set of institutions necessary for implementing this legislation and assisting companies that are technically and financially involved in renewable energy projects. Montenegro is currently working on a whole package of renewable energy and energy efficiency strategic documents, and on primary and secondary laws. Serbia adopted the Decree on Feed-in Tariffs for RES in December 2009.

Institutional barriers

Institutional support relates mostly to the national administration for science and technology but also to the administration responsible for environmental protection, economy, finance and regional development, as well as the administration for energy and transport. Furthermore, coordinated actions between these institutions are needed in order to streamline the very limited human and financial resources (in case of SEE countries) that these institutions can offer for supporting eco-innovation. In EU countries, this national-level coordination gap can be supplemented (subject to individual project proponents’ capabilities) by using EU institutions, programmes and funding schemes such as the Executive Agency for Competitiveness and Innovation (EACI) and its programmes (Eco-innovation Programme; Intelligent Energy Europe; and Marco Polo Programme), the Environmental Technologies Action Plan (ETAP), FP7 and LIFE Plus. In contrast, SEE countries have to rely on scarce assistance from bilateral donors’ projects and IFI programmes and projects; some of the above-mentioned EC programmes, subject to eligibility and to mandatory cooperation with organisations from EU member states (which may not necessarily be interested in cooperating with institutions from SEE countries) and minor segments of IPA funds.

With the exception of Croatia, the studied countries lacked the institutional capacity to create sufficiently supportive institutions, to design, implement and enforce policies and legislation for eco-innovations and technology transfer, or to monitor their results. The key challenge is the strengthening of the institutions in order to increase the absorption capacity for attracting and properly using international funding on an ongoing basis.

In most of the studied countries, the national institutions relevant for promoting eco-innovation (such as energy efficiency, recycling, and cleaner production agencies and centres) are either not yet in place or very weak in terms of personnel capacities, political leverage and available funding. In most of the observed cases, these institutions have been created on the basis of foreign assistance projects, which sometimes included funds for small pilot projects at the municipal level. Once this funding is used, such institutions become practically inactive.

In the context of institutional structures, Croatia is one step ahead. As shown in the country profile in Chapter 1 and in the good examples in Chapter 4, the key domestic players in supporting eco-innovation in Croatia are the Ministry of Economy, Labour and Entrepreneurship (especially the Department for Stimulating Investments and the Energy and Mining Division), the Ministry of Science, Education and Sport (especially the department responsible for the development of technical culture); the Fund for Environmental Protection and Energy Efficiency (EPEEF), and the Croatian Bank for Reconstruction and Development (HBOR), which can be seen as a national network for systematic support to eco-innovation on a long term basis. The EPEEF and HBOR have a joint loan programme and the general coordination between these institutions and the relevant ministries is better than in the case of other studied countries.

Economic and financing barriers

Financial barriers, according to Ashford (1993, cited in Kemp et al. 2004), include the higher costs of developing new technologies in comparison with traditional ones; a preference for the short-term profitability of established technologies over the long-term profitability (and perceived lower profit margins) of new technologies; perceived risks regarding consumer acceptance of new technologies and products; increased management requirements associated with the introduction of new green technologies in enterprises; and the potential lack of supplier support and the risk of losing clients if certain products cannot be delivered for a certain period in the case of technology change in the production process.

These factors relate mostly to old EU member states. In SEE countries the problems are more basic. In a situa-
tion in which economies are struggling to attain GDP and growth rates comparable to EU member states, and where basic environmental infrastructure is still underdeveloped, the existing public funds for environmental protection are not sufficient even for supporting the essential municipal environmental infrastructure. Therefore, none of the national environmental protection public funds are used for supporting eco-innovation, except in Croatia, where these funds are partly allocated for the sustainable energy sector. Small amounts of the public research and development funds are allocated to R&D in the eco-technology sector.

According to the European Commission’s Environmental Technologies Action Plan (ETAP, EC 2004), the economic barriers to introducing green technologies into production processes in EU countries range from market prices that do not include “externalities” (i.e. the external environmental and health costs of products or services), to the fact that investments in environmental technologies induce higher costs because of their perceived risks, the size of the initial investments or the complexity of switching from traditional to environmental technologies. In the studied SEE countries, additional problems are caused by meagre state and private sector funds as well as the very low prices for energy.

In developed countries, the financial barriers include the lack of market demand from the private and public sector as well as from consumers, the lack of public funds for initial research and pilot projects (pre-commercialisation) and the lack of private capital and interest for financing the full commercialisation of new technologies and products. Therefore, EU countries (especially the EU-15) experience sufficient public funding for early phases of eco-innovation, and sufficient private financing for the commercialisation of fully proved new technologies and products, but a lack of both public and private funding in the middle of the eco-innovation range, that is, for technology development and demonstration projects and facilities (see graph below; EPE, 2008).

In the studied SEE countries this gap is much deeper and wider. There is very little investment from national governments or industry. “Angel investors” or “business angels” do not exist in the eco-technology sector in the studied countries, and there is no interest from venture capital because of high perceived and actual risks. The gap is partly but insufficiently covered by IFI and bilateral donor programmes. These programmes typically cover the introduction of (foreign) green technologies to the market rather than the stimulation of domestic research and technology development, or of the commercialisation and market introduction of those domestic technologies, which is a big strategic and — in the long term — economic loss, since the study identified scientifically and technically strong domestic research and technology development institutes, especially in Croatia and Serbia.

Governments

The roles of the governmental agencies are described in the individual country profiles in Chapter 1. Regarding
the financing of eco-innovation, the governmental agencies set up to support sustainable energy, cleaner production and all of the sectoral agencies showed dependence on the current foreign aid programmes. The exception is Croatia, where we identified several strong and competent institutions supporting various aspects of eco-innovation on an on-going basis (see Croatia country profile in Chapter 1).

**IFIs and banks**

Private banks do not have personnel that understand the specific conditions and needs of the green-tech sector. Private banks may invest in low-cost projects with short payback times, but are less likely to invest in projects with longer payback times. The private banks will typically only support eco-innovation as on-lenders of allocated funds from IFI reserving strong and competent institutions (limited to energy efficiency and renewable energy), as described in the previous section. A positive element in these mechanisms is the accompanying grants for technical assistance in project preparation. However, in most cases these projects involve importing foreign green technologies rather than supporting the development of domestic ones. Thus, these mechanisms cover only the far right side Figure 3 and even that, in most cases, in favour of foreign rather than local companies. Furthermore, because of the on-lending element, the final loan conditions are not significantly better compared to commercial loans.

A good example worth replicating in other countries in the region is the Croatian Bank for Reconstruction and Development (HBOR), which, similarly to private banks, provides on-lending of funds from IFIs. However, being the national development bank, it is willing and able to keep interest rates further below commercial ones than is the case with private banks. Secondly, HBOR has permanent personnel with adequate training and professional experience for their different lending programmes, such as the one for renewable energy and energy efficiency.

**Industry**

There are no significant investments from industry into fundamental and applied research, because of the lack of both money and interest. Firstly, industry has not yet been fully privatised. Industry that is still publicly owned is struggling for survival and has no funds for improving existing technological processes, let alone investing in research and development in this field. Those industries that have been privatised are largely in the hands of foreign companies, which prefer to import fully developed new technologies from their own countries (thus partly covering the right side of Figure 3) rather than to stimulate local research institutions and small green-tech companies (that would cover the left side and middle of Figure 3). In addition, the low prices of natural resources and electricity, and inadequate parity of different fuels, further discourage investments into eco-efficient technologies.

Several recent energy price surges have somewhat raised interest in renewable energy and energy-efficient technologies in the industrial sector. However, with the weak economies in the region, most domestic companies lack sufficient capital to introduce large-scale energy efficiency measures or to modify their existing power/heat installations to renewable energy sources. The recently established IFI regional mechanisms for supporting EE and RE (described in Chapter 2) have the potential to assist in this matter. However, it remains to be observed how this will work in practice. Our estimate is that only the medium to large industries privatised by domestic capital will have the capacity to absorb these loans, while the publicly owned ones will miss the opportunity. Furthermore, there are small to medium businesses that are ready to install more efficient technologies, but their projects are too small to qualify for the loans from these IFI mechanisms.
Albania

Among the international organisations operating in Albania, the United Nations Development Programme (UNDP) is the most active in supporting eco-innovation. UNDP Albania helps the Government of Albania to protect the environment by addressing global environmental issues and the sustainable management of resources, including support for the use of renewable energy sources. More specifically, UNDP supports the Climate Change Unit within the Ministry of Environment, Forestry and Water Administration. The UNDP’s Climate Change Programme works with the ministry to produce the reports required under the United Nations Framework Convention on Climate Change and its Kyoto Protocol. UNDP promotes solar water heating in the marketplace, with a project that foresees the installation of 70,000 m² of solar panels in Albania, with a cumulative greenhouse gas reduction potential of 1.5 million tons over the next 20 years. In addition to the technical and financial support given to government counterparts, UNDP provides support to a number of non-governmental and community-based organisations working on specific environmental concerns.

The former Yugoslav Republic of Macedonia

In the former Yugoslav Republic of Macedonia there are a large number of relatively small energy efficiency and renewable energy support projects funded by individual bilateral donors and IFIs, including the Netherlands, through the Programme for Cooperation with Countries in Central and Eastern Europe (PSO Programme) (EUR 3 million); Austria, through the Austrian Development Agency, for projects focusing on the efficient use of geothermal and solar thermal energy (EUR 1.12 million); Switzerland, through the Swiss State Secretariat for Economic Affairs (SECO), for the realisation of the project “Energy-Efficient Distribution” (CHF 1.21 million); USAID, which provided support for the preparation of the country’s Energy Efficiency Strategy until 2020; the EBRD, through support provided for power sector reform and industrial energy efficiency projects; the Global Environment Facility (GEF), for the project “Sustainable Energy” (2007-2010) (USD 5.5 million through the World Bank as implementing agency).

Bosnia and Herzegovina

The small enterprise Turbina IPD Ltd., based in the town of Kotor Varos, specialises in research and development in the domain of sustainable energy production. In 2004, a two-member team started testing and improving their prototype vertical axis wind turbine for small energy users. In 2006, the project was one of 30 that won a USD 35,000 prize through the World Bank’s Development Marketplace competition, which in 2006 focused on water sanitation and sustainable energy. The prize money was invested in further project development. The award drew the attention of investors and the team signed a contract with three German investors to form a five-employee technology research and development company in BiH. The investment of the first two German partners was targeted to the pre-commercialisation of the vertical axis wind turbine product. The company was registered in November 2006.

In 2007, the company further tested and developed the product and submitted two related patent applications to the World Patent Organisation (WPO). Both patents were confirmed at the beginning of 2009. The third German partner is currently searching for bigger investors that would provide funds for the full commercialisation of the vertical axis wind turbine, the development of auxiliary equipment and of different types of turbine (suitable for different conditions and applications), as well for the development of several new patents (a micro hydro power turbine generator and an energy-efficient low-voltage direct current electromotor), in order to broaden the product spectrum.

Compared to horizontal axis wind turbines of similar capacity, this product has a number of advantages. It is
multipurpose, operates efficiently within a wide range of wind speeds, and does not drop in energy output when the wind direction changes. Noise and vibration levels are dramatically lower, and it is safe for birds and humans because of the fixed stator and the shape of the supporting construction. For this reason, its life span is four times longer, it operates better in harsh weather conditions, and several turbines can be mounted on the same shaft. The turbine is also easier and cheaper to produce, and easier to maintain.

The forthcoming EC regulations on mobile telephony will require that mobile telephone base stations use a minimum of 20 percent of their energy from renewable sources and cut an additional 20 percent of energy use through energy-efficiency measures. The vertical axis turbine, in combination with mounted solar panels, is ideal for the self-powering of mobile telephone base stations, since the base station support construction serves at the same time as the construction for the turbine and solar panels. The company sees this as its main niche on the EU market.

The company is optimistic about finding bigger investors that will fund the full commercialisation phase. It expects to sell around 10 pilot vertical axis wind turbines during 2009 and 2010. Contracts are currently in the negotiation phase for the installation of seven pilot projects in neighbouring countries, as well as for the installation of the turbine in existing mobile telephone transmitters in Slovenia, which would be the first such example globally.

Croatia

As mentioned earlier, Croatia is the leading country in the region with respect to national support and financing for eco-innovation. Croatia's support “system” has not emerged out of a specific strategy for supporting eco-innovation, but rather from a number of separate financing and support initiatives in the fields of science, research and technology development, energy development, economic growth and SME development, and environmental protection.

The Ministry of Economy, Labour and Entrepreneurship (MoELE) contains two units that provide support to eco-innovation: the Department for Stimulating Investments and the Department for Renewable Energies and Energy Efficiency (within the Energy and Mining Division of the ministry). The MoELE has drafted a substantial number of laws and regulations for stimulating SMEs (including innovation and green-tech SMEs) and for stimulating investments in renewable energy and energy efficiency, in terms not only of installing foreign technologies, but also of developing domestic ones. According to interviews with various third-party stakeholders, these units have a small number of very highly skilled and proactive staff, who contribute not only to legislation drafting but also to investment project preparation and implementation.

The Department for Stimulating Investments provides technical assistance for domestic and foreign investors in project preparation; coordinates with other relevant ministries and agencies in order to speed up the application procedures and project realisation; and assists project developers in solving concrete problems. Based on these experiences, the department recommends and drafts further improvements of the legislation relevant to stimulating investments, especially in the SME sector.

While the department does not have a special focus on green industries, there is no discrimination against them, either. Furthermore, all legislation related to investment stimulation contains provisions that all projects, in order to be eligible, must comply with relevant environmental legislation and standards. According to interviews, in the past three years the department has observed an increase in project applications from green-tech companies that have received support from the department. This is especially true in the domain of sustainable energy and recycling (and material efficiency in general). This is directly connected with the relevant EU financing programmes (described in Chapter 2 on international funding mechanisms) that require national co-funding. The department has also observed interest on the part of the private sector for investing in such projects, as EU and national funding provide some guarantees for the success of the projects in question. This effect was first observed in 2005 in the recycling sector, and since 2008 has also been apparent in the sustainable energy sector.

Most of these projects chiefly involve the importing of foreign green technologies and their installation in domestic facilities. According to interviews with several domestic green technology developers and producers, there should be greater incentives for stimulating the development and production of domestic green technologies. This is partly, although not sufficiently, addressed through a funding programme managed by the Department for Renewable Energy and Energy Efficiency of the Energy and Mining Division (see below). As mentioned in the Croatia country profile, the Regulation on Investment Incentives from 2006 includes the research, development and commercialisation of new products and technologies in its focus areas.

The Department for Stimulating Investments is now gradually switching from direct financing (grants and loans) to indirect incentives such as tax and customs relief, as well as annual rewards based on successful business criteria. In this way, the incentives are focused on the most competitive and best-performing companies in all industrial sectors, including green technologies. In the context
of pre-accession, many companies are preparing to modify their technologies and products to be in line with EU standards (including environmental ones) in order to avoid higher taxes for non-compliant products and technologies after EU accession.

The Department for Renewable Energy and Energy Efficiency within the Energy and Mining Division of the Ministry of Economy, Labour and Entrepreneurship was the key institution in preparing the numerous pieces of legislation aimed at stimulating the energy efficiency (EE) and renewable energy (RE) sector, as discussed in the Croatia country profile. The department proposes and manages stimulation programmes for the sustainable energy sector; monitors and analyses the implementation of EE and RE policies and strategies; identifies barriers; and recommends further measures for improving the implementation of these policies and strategies. The department also runs a register of RE and EE projects and installations. The department comprises three sections: Renewable Energy Sources, Energy Efficiency, and Bio-fuels.

The department currently runs a programme for co-financing the development of domestic green technologies covering up to 30 percent of proven eligible costs in the form of (ex-post) grants. However, this is limited exclusively to the sustainable energy sector, and the total annual funds for this purpose are around EUR 1 million. According to interviews with several domestic green technology developers, this amount should be augmented 100-fold in order to provide fair competitive conditions for domestic producers. Nevertheless, the Department for RE and EE has observed a rise in the number of projects and project funding applications related to the domestic production of components and equipment for EE and RE installations, such as wind generator axes and electronic equipment for various installations, mainly for photovoltaic (PV) modules.

Montenegro

The “2009, Year of Energy Efficiency” project is supported by GTZ, the Government of Norway, and the Montenegrin Ministry of Economic Development. The project includes a number of programmes supporting different aspects of EE. One programme focuses on developing legislation relevant to supporting the EE and RE sector in general, and EE in the construction sector in particular. The second programme deals with institutional capacity, with the objectives of establishing an agency for EE as an independent national-level administrative institution, and establishing an independent fund for financing EE. Other programmes address public information and education, energy efficiency in public buildings, the promotion of renewable energy resources on the demand side (e.g. RE installations in buildings), investments in solar energy systems, and energy efficiency at local level.

The project “Small Hydropower Development” is supported by UNDP and GEF, with a budget of around USD 1 million. The goal of the project, which is to be completed by mid-2011, is to reduce greenhouse gas emissions by creating favourable legal, regulatory and market conditions and building institutional and administrative capacities to promote the development of Montenegro’s small hydropower potential for grid-connected electricity generation. The objective is to increase new power-generating capacity in Montenegro by up to 20 MW, with an estimated annual reduction of up to 26,824 tons of CO2eq by facilitating the development of new small hydropower plants. The activities include removing existing legal, regulatory, institutional and market barriers to private investments in small hydropower development in Montenegro by streamlining and simplifying the application procedures for small renewable independent power producers; collecting basic data to make investment decisions; and setting attractive but competitive business terms and conditions for investors in this sector.

In the wind sector, soon after the enactment of the Decree for Wind Power Plants in September 2009, 15 foreign companies officially expressed interest in building wind power facilities in Montenegro. Most of these companies are from Italy, and there is also interest from the Norwegian power company NTE. Companies from Spain, Denmark, Germany, Russia, the USA, Romania, Greece, Croatia and Serbia are also considering entering the Montenegrin wind energy sector.

Serbia

The National Energy Efficiency Programme (NEEP, 2001-2009) supported research, development and demonstration (RDD) in the field of EE and RE. The programme was launched in 2001 by the Ministry of Science and Technology with a budget of around EUR 2 million per year (between 2002 and 2008).

The main objectives of the NEEP were to demonstrate, promote and implement new energy management methods and new efficient and environmentally acceptable technologies; to unite fundamental research and RDD with engineering activities and feasibility studies; to include EE in all subsectors of the energy system; and to unite the activities of institutes, universities, engineering organisations and industry.
Each year, the NEEP published an open call for the following types of projects:

- Strategic studies in order to give a basis for policy formulation in EE/RE and to create a database of energy potential, natural resources and EE resources (maximum 12 months).
- Research, development and demonstration (RDD) projects, with the aim of gaining new knowledge, followed by the demonstration and implementation of new technologies and equipment (maximum three years).
- Demonstration projects, including pilot plants in order to demonstrate new technologies and equipment, engineering and managing methods using existing knowledge (maximum 12 months).
- Feasibility studies (FS) for demonstration projects (maximum 12 months).

The eligible project topics included EE and RE in all subsectors of the energy system: energy efficiency in electric power production, transmission and distribution; energy efficiency in industry, municipal systems and households; the development of domestic systems and boilers burning solid fuels; the use of alternative and renewable energy resources; and energy efficiency in buildings and transportation.

The eligible NEEP project applicants included public enterprises, local authorities, municipal public services/utilities, large agricultural farms, the food industry, the paper and pulp industry, domestic producers of small ovens and boilers, and domestic producers of equipment for small hydro power plants.

Projects financed through seven annual open calls for proposals included seven national or sub-national studies of RE potential, 44 strategic studies (some of which included one or more project feasibility studies), 231 RDD/PP projects, and 63 single project feasibility studies.

According to the findings of the Ministry of Science and Technology, utilities were the best partners, having more funds and qualified engineers than SMEs. The utilities were also able to use project results in further operations. Engineering design and implementation firms were not interested in being partners in NEEP projects, as they preferred to buy/install equipment. Industries mostly did not have sufficient own funds for the further implementation of EE and RE project results. In addition to lack of funds, equally important obstacles were the lack of appropriate legislation and binding standards, low energy and fuel process, and lack of financial incentives.

The results of RDD and PP projects were implemented only in a small number of cases, in state-owned utilities with sufficient own funds, and only in sectors that are still doing relatively well, that is, the food industry, the paper and pulp industry, and agriculture. However, the NEEP did have positive strategic impacts (Oka, 2009):

- EE has been nationally recognised as a particular topic of strategic importance.
- The strategic studies on RE potential determined actual RE potential in the country (the most important being biomass, wind and small hydro power plants), thus influencing the preparation of energy policies.
- Scientific and research institutions have been reoriented to solving problems in EE and RE.
- Fundamental and applied research were promoted through demonstration projects and pilot plants.
- A large number of feasibility studies and detailed pilot plant designs have been prepared for future investments, subject to an improved financing climate.

In the light of the recent adoption of the Decree on Feed-in Tariffs for RE Installations, the improving economic and financing conditions, and the expanding private sector in Serbia, it is expected that some of the NEEP projects’ results (technology and installation projects, pilot plants, and feasibility studies) will enter into the commercialisation phase.

In Serbia, intensive activities could also be observed on the part of the private sector in the domain of recycling, despite the lack of adequate legislation and administrative support. In cities and bigger towns, many small enterprises are taking over the niche of paper, glass and electrical and electronic waste recycling, as most of the waste public management utilities are still not willing or able to perform these activities themselves. The two biggest private recycling operations in the country are the “Ball Packaging” factory’s centre for the collection of used aluminium cans and a collection network that covers not only Serbia but also the neighbouring countries; and an electrical and electronic waste recycling centre owned by two Serbian SMEs originally dealing with computer hardware and software. Both centres are located in Pancevo, a town near Belgrade, which is heavily polluted by local industry and the oil refinery. Another example is a public-private partnership in the town of Becej, between the local waste management public utility company and an Austrian waste management private enterprise, which has resulted in the creation of a successful municipal scheme for the collection of separate waste streams and the establishment of a recycling centre.
In the examined countries, progress in eco-innovation is slow, because there is essentially no market for the application of green technologies or for research and development in that field. The first prerequisite for creating the market for eco-innovation is to have clear legislation that requires higher environmental and energy performance from industry and the public sector, with suitable adaptation periods as well as a broad spectrum of relevant strategies and their implementation plans. The second prerequisite includes state administration and non-governmental institutions that would support various aspects of eco-innovation. The third consists of financing conditions favourable for research, development and demonstration (RDD) and the implementation of green technologies and products.

Generating systematic and efficient support for eco-innovation at the national level requires coordinated legal, administrative and financial support measures on several fronts. State support is needed for science, research and innovation, and for SMEs, as well as for environmental protection sectors such as sustainable energy and resources management, recycling and cleaner production. In addition, a strong economy with healthy domestic public and private enterprises is needed, as is an attractive environment for domestic and foreign investments.

Strategies and legislation

Regarding strategies and legislation relevant for the promotion of eco-innovation, Croatia is again in the forefront. While in most countries the design of strategies is a lengthy process, often slowed down by political influences and administration changes, in Croatia the process of drafting strategies (especially in the domain of science and research) was more independent and led by ministerial in-house and external experts in the relevant fields. This resulted in more up-to-date strategies, followed by concrete action plans as a rule, while in the other examined countries, adequate implementation plans are exceptions.

Furthermore, national development and sustainable development strategies and plans should contain concrete measures for supporting science and technology development, innovation, and environmental protection. The SEE countries should copy examples from EU countries such as Ireland and the UK, where innovative and eco-innovative enterprises receive substantial assistance from the state and local administration.

Most examined countries have introduced the necessary primary legislation, but not the secondary legislation which would facilitate the actual implementation of concrete provisions. Croatia does have sufficient sets of secondary legislation, especially in the domain of sustainable energy promotion. Serbia enacted the Decree on Feed-in Tariffs in December 2009, and Montenegro is currently finalising a full set of sustainable energy promotion regulations.

Other sectors of interest (recycling and cleaner production) are less well covered with adequate secondary regulation. As a result, even in Croatia there are problems in applying recycling and cleaner production, let alone promoting research and development in these sectors. In the case of Croatia, technology developers in the recycling and cleaner production sectors do have some support through extra-sectoral legislation (legislation on state aid, SMEs and R&D support).

Indeed, the key difference that sets Croatia most clearly apart from the other studied countries is the abundance of clear rules regarding investment promotion; state support for and private investments in SMEs; and state aid for research, development and innovations (RDI). Other countries in the region would benefit from applying Croatia’s approach to the problem from all relevant aspects, as well as enabling experts in the field to have greater influence on the design of strategies and legislation, with clear principles, rules and implementation plans (for strategies), and accompanying regulations and standards (for laws).

Both strategies and legislation should take into account the fact that industry needs appropriate adaptation periods in order to meet new standards, and these adaptation periods should contain phases for incremental improvements. Otherwise, industries may have to apply end-of-pipe technologies, which is not only less efficient and effective, but also counter-productive to eco-innovations.
tion. Such negative examples from EU member states, especially new member states, should be avoided in SEE. Furthermore, the existing legislation in SEE countries should be modified in order to decrease the number of permits and speed up the registration and application processes for eco-innovative companies and projects.

Another common problem in most of the studied countries is that legislation was designed using only relevant EC directives as a model. Apart from using relevant EC directives as basic reference documents, legislators should use specific legislation examples from certain EU countries that are particularly successful in certain areas. Their legislation should be analysed and used as models for designing provisions for supporting SMEs; RDI; promoting FDI; fineing non-compliance in industrial emissions, promoting recycling, renewable energies and energy efficiency; and creating pressures that motivate companies to innovate and/or implement clean technologies.

Regulation that are based on good practice principles and positive lessons learned from successful EU states would lead to the better promotion of clean technology implementation and development; the reduction of energy consumption per unit of production; improve waste management and increased recycling within private companies, state institutions, and municipal and regional waste management facilities; improve resources management within companies (energy, raw materials, water); and an increased share of renewables in the total national energy supply. In the researched countries, we could observe such effects only in Croatia, and even there limited to renewable energy and energy efficiency (and partly to recycling).

Institutional support

In the studied SEE countries, we observed various patterns and degrees of institutional support for eco-innovation. Most of these countries, being affected by conflicts and/or slow transition in the 1990s, have initiated substantial transition efforts only since the turn of the century. As all sectors of the economy and state administration needed reform at the same time, resources for reforming and supporting the relevant eco-innovation sectors (environment, science and technology) were scarce. Nevertheless, 2008 and 2009 saw some substantial improvements.

Overall, due to EU pre-accession activities, Croatia made an early start, and has achieved the biggest progress. The EU pre-accession process has had a two-fold positive effect: the necessity to harmonise legislation in all sectors, including environmental protection and state aid for SMEs from one side; and the availability of more EU funds for supporting the economy, including green-tech companies on the other.

At this time, the emergence of an institutional network for supporting eco-innovation, especially for the sustainable energy sector, can only be observed in Croatia. There are several strong institutions that administratively and/or financially support eco-innovation: the Ministry of Science, Education and Sport, which supports fundamental research and scientific cadre development; two departments from the Ministry of Economy, Labour and Entrepreneurship (the Department for Stimulating Investments and the Department for Renewable Energy Resources and Energy Efficiency); the Fund for Environmental Protection and Energy Efficiency (EPEEF); the Croatian Bank for Reconstruction and Development (HBOR); four national bodies for regulating the energy market and supporting renewable energy producers; as well as a national business innovation centre which supports the commercialisation of R&D results and the development of private firms and research organisations, and provides grants for financing research projects of SMEs.

These institutions provide different forms of support, from partial grants and loans, through technical assistance, to tax and customs relief. Such a wide spectrum of supporting mechanisms, most of which are based on fair competitive principles, means that many worthwhile eco-innovative institutions and projects, especially in the sustainable energy sector, are able to obtain the necessary support. In the sectors of recycling and cleaner production, there is far less support overall, and proportionally even less for eco-innovation activities.

In other studied countries there is practically no coordination between different institutions relevant to supporting eco-innovation, and institutions themselves are less strong. Since the turn of the century, many relevant ministerial departments and independent state agencies have been created, mostly through foreign assistance projects, but most of them have not succeeded in standing on their own feet after the termination of the projects. A good example of a strong and active institution other than in Croatia comes from Serbia, where the Ministry of Science and Technology plays an important role in supporting research and development. The National Energy Efficiency Programme (NEEP) financed the realisation of strategic studies, R&D projects and demonstration projects in the field of energy efficiency and renewable energy between 2001 and 2009. In 2009, the NEEP was succeeded by the Technology Development Programme, which has a wider thematic scope. However, one strong institution is not enough — there is a need for a network of institutions such as exists in Croatia.

The other key point in Croatia is that the two most
important institutions for eco-innovation are strong financing institutions: the Fund for Environmental Protection and Energy Efficiency (EPEEF) and the Croatian Bank for Reconstruction and Development (HBOR). This point will be elaborated in the following section on financing, but in Croatia it is also beneficial that other agencies and ministry units have the power to either finance projects and companies or to provide tax and customs reliefs for eligible projects and companies. Otherwise, the effectiveness of such institutions (as is the case in the other studied countries) is entirely dependent on foreign assistance projects that come and go.

A measure to strengthen such institutions would be to introduce revolving fund mechanisms (no matter how small) in order to cut dependency on time-limited foreign development aid projects. Another measure would be to introduce performance criteria and goals on institutional and individual level. Also, green public procurement legislation and mechanisms should be improved in order to turn all administrative institutions into eco-innovation drivers.

Financing mechanisms

In Croatia in 2008, GDP (PPP) per capita was USD 16,474 — almost double the second-ranking country in the region (the former Yugoslav Republic of Macedonia at USD 9,128 per capita). In previous years this ratio was even higher. Along with better developed legislation, institutional support and the higher availability of EU funds, this enabled Croatia to invest more in the research, development and actual application of eco-technologies. This situation resulted not only in the faster development of the sustainable energy sector (and, to some degree, the recycling sector) but also a healthy climate for domestic research and development institutes and companies.

Furthermore, Croatia managed to form (even if unintentionally) a national institutional and financial eco-innovation support network that, in a coordinated way, channels available foreign funds. This support network significantly increased the absorption capacity for these funds. The two key national financing institutions, the EPEEF and the HBOR, provide funds from the national budget and channel funds from major IFIs (mainly from WB, EBRD, and KfW) and from the EC. It also provides technical assistance for the preparation of projects that apply for these funds. These funds, channelled through the EPEEF and HBOR, are available in the form of subsidised loans and additional grants for project preparation. In addition, relevant units from different ministries (responsible for science; economic and technical development; energy; and environment) provide tax and customs reliefs, additional technical assistance, and/or smaller grants and loans.

In other countries in the region, IFI mechanisms for EE and RE are also available, but their funds are distributed through private banks, which, in the end, makes these loans less preferential than in the case of Croatia. Often these loans end up having the same or similar conditions as commercial loans. These countries could copy the Croatian model and form a national bank dedicated to reconstruction and development, and a fund for environmental protection and energy efficiency. In Serbia, a national Fund for Environmental Protection exists, but it does not include energy efficiency, nor are there programmes for supporting any form of eco-innovation. Currently, the activities of this fund are limited to assisting regional waste management projects. The two entities in Bosnia and Herzegovina also have their environmental protection funds, but their financing capacities are insignificant, and they do not support energy efficiency, recycling, cleaner production and/or research, development and demonstration (RDD). Montenegro is currently working on establishing one fund for environmental protection and a separate one for energy efficiency.

Regarding the IFI loans for renewable and energy efficiency projects, their minimum sizes are in most cases too high, both for the struggling public sector giants and for the emerging private SMEs. The small number of big private companies in the industrial sector would be more interested in such loans if the fuel and energy prices were not still very low.

All examined countries have insufficient legal provisions and actual schemes for supporting cooperation between the public and the private sector. Such cooperative funding schemes could greatly increase both RDD and the actual application of eco-technologies. These schemes could support cooperation between research institutes and companies on one hand, and SMEs in the technology sector on the other. This would primarily cover the gap in funding applied research and demonstration/pre-commercialisation projects. In turn, this may draw the attention of medium-sized enterprises to invest in the full commercialisation and actual application of such technologies within their own facilities, instead of importing the more expensive foreign ones.

Secondly, public and private sector cooperation support schemes could also bring results in terms of the greater application of existing eco-technologies and products (be it domestic or foreign), especially in the recycling sector. We have provided a good example of such cooperation in Serbia, where a public-private partnership be-
tween a municipal waste utility company and a foreign waste management partner upgraded the existing landfill to EU standards, improved overall waste management, and introduced a successful municipal recycling scheme, without any state support. The waste managing utilities which will, considering the current applicable laws in all examined countries, largely stay in public hands, could be encouraged to subcontract private companies to organise the recycling parts of their operations.

Indeed, we observed great interest, especially in Serbia, on the part of small enterprises in the private sector (and some medium and large enterprises as well) in expanding their activities into the recycling, renewable energy, and energy efficiency sectors and/or in introducing energy efficiency and recycling measures in their own production facilities. What is lacking, especially for the SMEs, are loans that are sufficiently small and preferential to be manageable17, and an opportunity to apply and sell their technologies, products and services to bigger enterprises (ranging from industrial to communal), which are still largely in the public sector and struggling. This also raises the issue of the need for a faster and, at the same time more transparent, privatisation process in all observed countries.

In the same two countries, there are a number of strong research institutes with staff interested in and capable of performing research and development in environmental technologies. In Croatia, some of these institutes (especially those dealing with energy efficiency, renewable energies and associated fields) have support from various state mechanisms as well as EU funds. Therefore, many of these institutes do participate in research and development projects, so that domestic technologies or products are often applied in EE and RE projects. Some of these institutes have also received state support in the processes of privatisation and/or realising public-private partnership arrangements.

In Serbia such institutes are receiving only limited state funding for R&D projects and, to a smaller extent, RDD projects that unfortunately cannot enter the commercialisation phase because of the lack of public and private funds for that purpose. Therefore, the research potential in Serbia is not used for application in the economy. Bridging funds are needed in order to achieve the full commercialisation of these technologies. In the remaining countries, there is even less support and therefore research and development activities are very limited.

In the absence of sufficient state funds for providing grants and loans for eco-innovation, alternative mechanisms should be applied, such as state guarantees (subject to verified business plans), debt loans, subsidies, tax and customs relief, green taxes, green savings schemes, investment guarantee funds, and green investment funds for mezzanine loans. A small number of these mechanisms are already well functioning in Croatia, but not in the other examined countries.

Finally, national schemes for promoting the visibility of eco-innovation companies and research institutes are missing. In Croatia and Serbia there are business and innovation centres that have been established recently, but none of these centres promote specifically eco-innovation institutes and companies. In the absence of such schemes at national level in the examined countries, regional West Balkans an eco-innovation/green-tech investment platform could be beneficial as a mechanism to promote the visibility of eco-innovation companies and research institutes by connecting relevant governmental units and agencies, regions, towns, municipalities and their associations and service utilities, relevant industry sector companies, public and private banks and IFIs, and venture capital with the eco-innovation institutes and companies, through a series of targeted national and regional meetings and round tables for different eco-innovation sectors. Such a platform should include a website portal where eco-innovation institutes and companies would have space to present themselves and their work to public and private, domestic and foreign investors and to potential users of their technologies, products and services. The platform would also actively inform the private and public sector about the economic benefits of applying green technologies and eco-innovation in their operations and facilities.
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Notes

1. Funding the Development of Environmental Technologies Study for DG Research (EPE 2008)


5. Available at: http://www.dsdc.gov.al/dsd/d/pub/business_and_investment_devel


7. The NPEP of Croatia is available at: http://www.mzopu.hr/default.aspx?id=4248&Lang=Eng

8. Available at: http://www.ieabioenergy-

task38.org/countryreports/croatia/energy_strategy_croatia.pdf

9. For example, the wind farms Ravne I, Trtar-Krtolin, Stupisc, Jasenic and Orlice.

10. Available at: http://www.energetska-
efikasnost.undp.hr/attachments/181_Nacrt%20Energetske%20Strategije%20_Zelena_knjiga_101108.pdf

11. Available at: http://www.energetska-
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12. Available at: http://www.ieabioenergy-
task38.org/countryreports/croatia/energy_strategy_croatia.pdf


14. The official RSFF website can be found at: http://www.eib.org/products/loans/special/rsff/index.htm


16. Of course, Austria and Denmark in energy efficiency, renewables and recycling, Sweden in cleaner production, Finland in technology and innovation support.

17. The recent KW credit line for small loans for small scale RE and EE projects in SMEs may partly cover this gap, but only on the application side of the eco-innovation spectrum, not on the RDD side.
THE REGIONAL ENVIRONMENTAL CENTER FOR CENTRAL AND EASTERN EUROPE (REC) is an international organisation with a mission to assist in solving environmental problems. The REC fulfils this mission by promoting cooperation among governments, non-governmental organisations, businesses and other environmental stakeholders, and by supporting the free exchange of information and public participation in environmental decision making.

The REC was established in 1990 by the United States, the European Commission and Hungary. Today, the REC is legally based on a charter signed by the governments of 29 countries and the European Commission. The REC has its head office in Szentendre, Hungary, and country offices and field offices in 17 beneficiary countries: Albania, Bosnia and Herzegovina, Bulgaria, Croatia, the Czech Republic, Estonia, Hungary, Latvia, Lithuania, the former Yugoslav Republic of Macedonia, Montenegro, Poland, Romania, Serbia, Slovakia, Slovenia and Turkey.

The REC actively participates in key global, regional and local processes and contributes to environmental and sustainability solutions within and beyond its country office network, transferring transitional knowledge and experience to countries and regions.

Recent donors are the European Commission and the governments of Albania, Austria, Belgium, Bosnia and Herzegovina, Bulgaria, Canada, Croatia, the Czech Republic, Estonia, Finland, Germany, Hungary, Italy, Japan, Latvia, Lithuania, Luxembourg, the former Yugoslav Republic of Macedonia, Montenegro, the Netherlands, Norway, Poland, Romania, Serbia, Slovakia, Slovenia, Spain, Sweden, Switzerland, the United Kingdom and the United States, as well as other intergovernmental and private institutions.