

EXECUTIVE SUMMARY AND KEY RECOMMENDATIONS

EXECUTIVE SUMMARY

Since the previous in-depth review in 2004, Luxembourg has reformed its energy policies across all sectors. It has also fully liberalised its electricity and natural gas markets, and is actively participating in the development of the evolving Central West European regional electricity system. It is in compliance with the IEA oil security requirements; it has prepared a broad action plan on energy efficiency and revised the requirements for energy efficiency in buildings. It has also changed car taxation to reflect CO₂ emissions and improved the support system for renewable energy sources. All these are significant improvements over the situation in 2004. The IEA congratulates Luxembourg for this clear progress.

Increasingly, the country's energy policy is and will be directed by decisions taken at the European Union (EU) level. This holds true for all EU member countries, but more so for Luxembourg because of the small size of its energy sector. EU law now sets requirements for electricity and natural gas markets, and for energy efficiency in appliances and buildings. It sets targets for total greenhouse gas (GHG) emissions and, through the EU Emissions Trading Scheme (EU-ETS), for CO₂ emissions from heavy industry and power and heat generation. It also sets minimum taxes the country must apply to energy products. The EU member states have non-binding targets for energy saving and for the share of renewable energy in total final consumption of energy (TFC), electricity supply and transport fuels. But this is not all.

The EU targets for 2020 on GHG mitigation, renewable energy and energy efficiency will shape energy policy in Luxembourg and the EU member countries in the coming decade. Under the target to reduce GHG emissions in the EU by 20% from 1990 to 2020, Luxembourg will have to cut emissions from the sectors outside of the EU-ETS by 20%. It will also have to increase the share of renewable energy sources in final energy consumption from 0.9% in 2005 to 11% in 2020, including providing 10% of transport fuels from renewable sources. And it will have to increase energy efficiency to contribute to the EU's target of reducing energy demand by 20% from the business-as-usual level in 2020.

In many ways, Luxembourg is a special case among IEA countries. It is the smallest member country, with the highest GDP per capita. Its economy employs the highest share of cross-border workers, around 40% of the workforce. It also has some of the lowest taxes on energy products, most

importantly on diesel. These characteristics all partly explain why the country has the highest total primary energy supply (TPES) level per head, the highest share of fossil fuels in its TPES and, consequently, the highest GHG emission per head among IEA countries. Oil accounts for more than 60% of TPES, and 90% of this oil is used for transport. Sales of diesel and gasoline to foreigners, in turn, account for roughly four-fifths of total transport fuel use. These significant diesel and gasoline sales to motorists and truckers who cross the border raise considerable tax revenues, but also lead to challenges in climate change policy and security of supply.

Climate change mitigation is a hard nut to crack for Luxembourg. The country must reduce its GHG emissions by 28% below their 1990 level in 2008-2012. More reductions will be needed after 2012, on the basis of a target of -21% from 2005 to 2020 for sectors covered by the EU-ETS, and -20% from 2005 to 2020 for all other sectors. Luxembourg's domestic efforts to limit CO₂ emissions have focused on promoting energy efficiency and renewable energy sources through various measures. Given the volume of transport fuel sales, however, these domestic measures will be insufficient.

Energy efficiency measures generally offer the least-cost options for domestic emissions reductions. In Luxembourg, the government has compiled a National Energy Efficiency Action Plan, with the aim of reducing energy use by 9% below the annual average of 2001-2005 by 2016, as required by EU law. The IEA urges Luxembourg to implement the plan without delay. Yet, even if fully implemented, the plan would only provide a partial solution to the emissions reduction challenge.

The economic viability for increasing renewable energy production is limited by the country's size, topography, nature protection policies and population density. Electricity from renewable sources contributes very little or nothing to meeting the country's target under the Kyoto Protocol, nor is it likely to for any future GHG target. This is because domestic renewable generation only replaces electricity imports, and these imports are not counted in Luxembourg's GHG balance, regardless of the energy source from which they are generated. Biofuels, in turn, contribute to reducing Luxembourg's GHG emissions, but they do little to improve the country's energy security, as they are all imported directly, or in the form of feedstocks. Domestic renewable energy sources are, therefore, not likely to significantly help in improving energy security and curbing GHG emissions at a reasonable cost. The country should consider all opportunities for green certificate trading and participating in international joint projects to be better able to reach the 2020 target.

In the short term, the largest contribution to meeting Luxembourg's GHG targets will come from the use of the Kyoto flexible mechanisms. The rules on their use after 2012, including any limits on the share of total emissions reductions they will bring, are yet to be adopted, but Luxembourg may find it will be necessary to reduce oil use. The government should prepare for

the post-Kyoto period by developing an integrated medium- to long-term energy and climate strategy, with a clear focus on measures in the transport sector.

Luxembourg is already increasing excise taxes on transport fuels to reduce the differences with its neighbouring countries, and earmarking these increased revenues for mitigating climate change. This policy deserves to be applauded, also on energy efficiency grounds, as higher prices encourage more efficient use. The government should consider continuing to gradually increase these excise taxes. It should also look further into the policies of the countries that have managed to successfully reduce oil use in space heating.

As Luxembourg depends almost completely on imports for its energy supply, securing these supplies is crucial for the country. Oil supplies are well diversified by country of origin, but more than 85% of the IEA minimum stockholding obligation is met by stocks held in neighbouring countries. Moreover, these stocks are often based on short-term leasing contracts, leaving the country vulnerable to potential oil supply disruptions. The government is intending to create a stockholding agency and to increase domestic storage capacity, but at the same time more than half of the current storage capacity may have to be closed in the next five years, requiring an even greater share of stocks to be held abroad. Without action, the country could face serious risks in its domestic oil supply chain, becoming more vulnerable to disruptions caused by events such as labour strikes or weather conditions which hinder fuel deliveries by road or rail. Large sales of transport fuels to foreign drivers are further putting at risk the availability of oil for domestic consumers in a supply disruption. The government should improve security of oil supply by urgently implementing a plan to maintain sufficient domestic storage capacity and swiftly revising the stockholding regime.

Supplies of natural gas are relatively well diversified by country of origin and by transportation route. The networks are well maintained, and interruptible contracts are further adding to security of supply. Network operators, suppliers and wholesale customers are also obliged to guarantee the security of supply to end consumers. As Luxembourg does not have natural gas storage or line pack, and the largest gas-fired power plant is not interruptible, raising the entry capacities would further improve supply security and provide greater flexibility for supply routes.

Luxembourg relies on imports for half of its electricity supply, and its electricity security largely depends on developments in neighbouring countries. Also for security of supply reasons, the country is actively pursuing the development of a regional electricity market in Central West Europe, and it is planning to increase its already ample interconnection capacity by new links with its neighbours. The IEA encourages the government to proceed with the implementation of these plans.

Since the last review in 2004, Luxembourg's electricity and natural gas market legislation has been fundamentally reformed on the basis of EU directives. The new laws entered into force on 1 August 2007. All customers are now free to choose their supplier, and third-party access to networks is guaranteed on an equal and transparent basis. The regulator has been strengthened, and *ex ante* regulation is now applied to network tariffs. Moreover, the electricity transmission system operators have been legally unbundled, and in the gas sector legal unbundling will take effect by July 2009.

Luxembourg's electricity and natural gas markets are both small and, as in many other countries, dominated by a few vertically integrated companies. The government continues to be the largest shareholder in the gas and electricity incumbents, and their merger is currently under review by the competition authorities. The government should continue to guarantee a level playing field for all participants, and ensure the regulator has sufficient powers and resources for doing this.

KEY RECOMMENDATIONS

The government of Luxembourg should:

- ▶ *Prepare for meeting future targets on greenhouse gas emissions by developing an integrated medium- to long-term energy and climate strategy, with a focus on transport.*
- ▶ *Consider all opportunities for certificate trading and participating in international joint projects to be better able to reach the 2020 targets for renewable energy sources and greenhouse gas emissions.*
- ▶ *Improve the security of oil supply by urgently implementing a plan to maintain sufficient domestic storage capacity and swiftly revising the stockholding regime.*