

SUMMARY OF CONCLUSIONS AND RECOMMENDATIONS

Since the last in-depth review in 2001, there have been a number of positive developments in Belgium's energy policy. Electricity and natural gas market reforms have further progressed in such areas as independent functioning of the electricity transmission system operator, allocation of cross-border electricity transmission capacity at the northern border using market-based mechanisms, the entry of new market players and the development of an electricity exchange, Belpex. Belgium is also working with its neighbours France and the Netherlands to further integrate their electricity markets and improve and increase cross-border exchange of electricity capacity. The regions and the federal level are taking measures to tackle climate change and achieve their part of the Kyoto commitment through such measures as rigorous building performance measures and green certificate trading schemes. A notable recent positive development is the decision to create a centralised oil stockholding agency. Despite this progress, Belgium still faces many challenges.

Under a complex division of responsibilities between the federal and regional governments, it is challenging to achieve national energy policy goals. This can reduce the efficiency and the effectiveness of the energy systems of Belgium as a whole. Furthermore, better integration between the regions of Belgium will facilitate integration with its neighbouring countries and with the larger European market. Belgium should continue to harmonise its regional energy markets' rules and regulations – a process that does not require all regions to adopt the same energy policies and goals – while it also works to integrate a cohesive Belgium with its neighbouring countries and Europe.

In 2003, Belgium passed legislation requiring the phase-out of nuclear power between 2015 and 2025. Nuclear energy currently supplies about 55% of the country's electricity generation. This huge supply gap will need to be covered by a combination of energy savings, electricity imports or additional electricity generating capacity. The effects of this phase-out will vary considerably depending on how nuclear power is replaced and how much energy is saved through energy efficiency gains. Various scenarios and their implications on energy mix, natural gas and electricity imports and carbon dioxide (CO₂) emissions suggest that the nuclear phase-out will increase CO₂ emissions substantially in 2030. Others, when assuming that nuclear power is replaced with efficient, environment-friendly technologies and that Belgium's substantial energy efficiency potential is realised, show that it is possible for Belgium to meet its long-term electricity demand without

increasing CO₂ emissions. Given the various scenarios, the federal government should conduct more comprehensive long-term studies on the effects of the phase-out of nuclear power and the available options to replace nuclear on energy security, environmental protection and economic growth. Such studies should be made public.

A law recently passed transfers some powers of the federal regulator to the federal government. The government should ensure that this movement does not weaken the power and effectiveness of the regulator. In moving towards competitive markets, stability and regulatory certainty are essential to remove market barriers and increase market efficiency.

The existence of the federal regulator and the regional regulators derives from the federal structure. However, the federal structure does not necessarily preclude the possibility of having more co-ordinated and national regulation, as in the case of Australia, which has created a new single national regulator replacing numerous regional regulators. The federal and regional governments should review the current multi-layer and multi-regulator structure. At the very least, the co-ordination and co-operation among the regulators should be further strengthened to avoid segmentation of the market and complex regulatory procedures.

Belgium has had a vertically integrated monopoly energy supplier of gas and electricity, which has since been legally unbundled. However, there is still cross-ownership and the supply companies, Distrigas and Electrabel, which both have Suez as their controlling shareholder, still have a dominant share of the Belgian gas and electricity markets. This structure could prevent the development of a well-functioning Belgian energy market. Appropriate measures should be taken to reduce the dominance of these incumbents. Furthermore, sufficient resources to prevent anti-competitive behaviour and intervene, when necessary, should be given to relevant regulators and authorities.

Belgium's 2003 greenhouse gas (GHG) emissions slightly exceed 1990 emissions, meaning that it has to reduce its total emissions by 8.4% from 2003 levels to meet its Kyoto commitment. By purchasing a portion of its reductions on the international market, Belgium must in fact reduce its emissions by around 7% below 2003 levels, and possibly less if the regions also purchase some emissions on the international market. Regardless of the exact amount of international purchases, it will still be a very challenging mission to meet. Not only does Belgium's emissions path since 1990 show that it is currently not on target to meet its Kyoto commitment, but modelling results also show that energy-related CO₂ emissions will surpass 1990 emissions by 8.3% in 2012 under one scenario. Nevertheless, studies suggest that Belgium can meet its Kyoto target, but this will necessitate significant actions to dramatically improve energy efficiency and fully implement the

European Union Emissions Trading Scheme (EU-ETS). The nuclear phase-out beginning in 2015 will make it more difficult to achieve further CO₂ emissions reductions beyond the first Kyoto commitment period. In developing its National Climate Change Plan, careful calculations of emissions reduction potentials and of the costs of policies and measures are essential to ensure cost-effectiveness and sustainability of climate change mitigation efforts.

Belgium has the opportunity for substantial energy efficiency improvements. However, it is clear that this would require a significant strengthening in the implementation of policies and measures to improve energy efficiency. Critical to this effort is improved monitoring of the results and cost-effectiveness of various policies and measures. All of the regions and the federal government are targeting energy savings in buildings. Much of this new legislation is being developed within the framework of the EU Directive on the Energy Performance of Buildings. Given the importance of the residential sector in Belgium's energy consumption, standards on the energy performance of buildings should be stringent enough to improve the sector's efficiency and bring it in line with EU standards. It is just as critical that the standards are effectively implemented. It is positive to see that emphasis will be placed on monitoring and enforcement.

Belgium's green and combined heat and power (CHP) certificate schemes, which promote renewable and CHP electricity development, can be improved in order to maximise their efficiency and benefits. For example, currently, most certificates issued in different regions cannot be traded between regions except between Wallonia and Brussels-Capital. In general, the lack of transferability of certificates harms the overall effectiveness of the programmes and prevents the development of more efficient renewable and CHP energy installations. To increase the efficiency of the schemes, and lower the overall costs, all regions and the federal government should strengthen existing efforts to ensure that all certificates are transferable. Models for this process are Sweden and Norway, which are discussing an integrated green certificate trading scheme. In addition, what installations are eligible for the certificates and the method of their calculation need to be harmonised. In designing the certificate system, minimum and differentiated certificate prices should be used with caution. While minimum prices provide certainty to potential investors, they could reduce the cost-effectiveness of green certificate schemes, and make them function like feed-in tariff schemes. In addition, differentiated minimum prices could hinder competition among various technologies and lead to inefficient and more costly renewable energy. Furthermore, minimum price levels could block reductions in certificate prices, increasing the costs of the certificate scheme.

Belgium has unique petroleum price caps in order to protect customers in the event of short-term price spikes. While oil prices in Belgium are well below the maximum ceiling, the price ceiling could reduce demand response to a price

spike and exacerbate any spot shortages of fuel due to rapid buying. The existence of price caps could also easily lead to political pressures for market intervention during price spikes. Belgium should consider removing these caps.

Belgium's recent legislation creating a centralised oil stockholding agency is a very positive development. The country should monitor the progress of the establishment of the agency to ensure as soon as possible long-term compliance with Belgium's IEA stockholding obligation.

Belgium's domestic gas demand is expected to rise by 2.9% annually over the next 10 years. A key issue is that all entry points to the country are contractually congested – the Suez Group continues to control nearly all entry capacity to the country on long-term contracts. Storage capacity is allocated each year according to priority rights that favour the Suez Group. All transit capacity that provides access to the hub in Zeebrugge is controlled by Suez under existing long-term contracts. In addition, the company has ownership interests in Fluxys (the transportation system operator), a majority of the distribution system operators, the services company and the Belgian electronic customer database. This concentration makes it difficult for other players to have access to the market and gives Suez the ability to leverage its market power.

To make greater progress towards a competitive energy market within Belgium, the energy market structure should be modified so that asset owners are given incentives to offer effective third-party access (TPA). This means that the interests of the inter-municipal distribution companies and the supply companies should be de-coupled through effective unbundling, Fluxys should be completely independent of gas suppliers and consumers, a secondary capacity market should be implemented and regulators should be given more power to enforce compliance within the market. If legal separation does not provide effective competition, then stronger measures – including ownership unbundling – should be considered. For a competitive market to develop, regulators must monitor the market and ensure that no conflicts of interest are allowed to remain between suppliers and other actors, including municipalities, either through ownership interests, preferred customer status or shared assets. The regulator should be free to collect information on these interests without having to justify why it is required so that proper investigations into market practices can be undertaken.

Belgium's gas consumption growth and its role as a pivotal European natural gas transit country places strategic importance on the degree of available border capacity linking Belgium to its neighbours, as well as maintaining and improving the quality of the gas network within the country. Currently, there is a lack of competition in the supply market, owing in large part to the lack of transportation capacity access. Belgium should consider ways to enhance security of supply by facilitating investment in and access to new border capacity via the use of transparent market-based mechanisms.

The cost of balancing services is a concern in Belgium, where balancing penalties are amongst the highest in the EU. It is the responsibility of the network users to balance their gas flows. However, imbalances are unavoidable, particularly for smaller suppliers without a significant portfolio, since volumes are determined the day before delivery, and consumption can deviate from expectations. Making more gas available to third parties and, as a result, increasing volumes on the traded market is essential to increasing the liquidity at the Zeebrugge hub, which would generate gas pricing that reflects fundamentals within Belgium. Liquidity would also be increased by providing more information to market players, and by collapsing the four regional gas markets (three high-calorie balancing zones and one low-calorie zone) into one high-calorie gas balancing zone that includes the Zeebrugge hub trading point and one low-calorie zone. The government should also consider providing TPA to blending facilities, which would allow competing high-calorie gas suppliers to service low-calorie gas consumers to enhance competition.

The elimination of the distinction between transit of international gas and transport of national gas would be beneficial for better integration with other European networks.

Belgium has made significant changes to its electricity market. At present, more than 90% of consumption is supplied through a liberalised retail market. The transmission grid is now managed by Elia, providing transparent and non-discriminatory access to the grid. These efforts have resulted in significant entry of new suppliers to the retail market. Despite these efforts, Belgium needs to continue to develop a competitive electricity market. In order to achieve a more comprehensive and integrated market, the regional and federal governments and regulators should open electricity markets in all regions without unnecessary delays. In addition, the regional and federal authorities should work together to ensure that market rules and regulations are harmonised, given the relatively small size of the Belgian market and even smaller size of the regional markets. In particular, differences in green and CHP markets, differences in public service obligation requirements and the need to obtain different supplier licenses in different regions create higher business costs for market participants.

Despite Belgium's progress towards opening its electricity market, the market power of the incumbent hampers true competition, discourages new entry and prevents the market penetration of other competitors. Furthermore, owing to nuclear facilities that have been largely depreciated, new entrants may find it more difficult to compete on price with the dominant incumbent. The government uses virtual power plant (VPP) auctions to reduce Electrabel's market share. VPP auctions should be conducted in an open, transparent and fair manner. If these efforts do not effectively reduce the incumbent's market dominance, stronger unbundling should be considered. In addition, despite legal unbundling of electricity distribution, Electrabel still manages some

operations and customer databases, which makes it difficult for retail suppliers to obtain customer data from the distribution network operators. Unbundling customer databases from Electrabel control should be completed as soon as possible.

Integration of Belgium's electricity market with the markets of other countries can diminish the market power of dominant players by enlarging the effective size of the market. An essential step is co-operation with neighbouring countries. Elia, the transmission system operator, has planned grid investments that would increase the present cross-border capacity. This is a positive development and should be accelerated. It is equally critical that the Belgium regulator and Elia continue to work closely with the transmission system operators of neighbouring countries to co-ordinate market operations. In this context, it is promising that in July 2005 the regulators of Belgium, France and the Netherlands issued a joint consultation document to facilitate regional market integration between the wholesale electricity markets of the three countries.

The appointment of Elia as the transmission system operator has greatly improved non-discriminatory access to the grid. In addition, cross-border transmission along the northern border with the Netherlands is allocated using market-based mechanisms. However, interconnection capacity along the southern border with France is allocated according to historical priority lists and is not market-based. This allocation method is counter to the market-based approach Belgium committed itself to through the EU directive, and hampers new actors from entering the Belgium electricity market, delaying development of an integrated regional European electricity market. The joint consultation document and plans to introduce market-based mechanisms for transmission capacity allocation at its southern border are commendable developments. Elia should continue efforts to evolve towards more market-based and cost-reflective balancing mechanisms. New legislation introducing multi-year methodology on approving transmission and distribution tariffs should be promptly implemented.

Belgium's 2003 energy R&D budget has increased significantly since 1999. This is a commendable development. At the regional level, growing emphasis on energy efficiency and, to a lesser extent, on renewable R&D, well reflects the priorities of regional energy policies. Belgium's collaboration with the private sector and universities, as well as its participation in ten IEA cross-country implementing agreements will help maximise the benefits of its energy R&D budget. It is important that Belgium further develop methods to review energy R&D policies and spending, to ensure that they are in line with overall energy policies, and that projects are cost-effective. Evaluating the performance of ongoing and completed programmes can result in more efficient use of limited financial resources. While federal and regional governments seem to be conducting some evaluation, they are encouraged to share their experience and expertise for *ex ante* and *ex post* evaluation.

Despite the decision to phase out nuclear, it is sensible to sustain nuclear-related R&D with a view to ensuring reliable and safe operation of, and expertise on, nuclear power and waste disposal through sufficient funding and staffing of SCK•CEN, the country's nuclear research centre.

RECOMMENDATIONS

The government of Belgium should:

General energy policy

- ▶ *Strengthen the collaborative process of the federal and regional governments – through CONCERE/ENOVER and any other forums – paying close attention to reducing any disjoints between energy policies that would significantly reduce efficiency.*
- ▶ *Harmonise energy policies and measures both between federal and regional levels and across regional levels.*
- ▶ *Deepen collaboration with neighbouring countries in order to increase the effectiveness of energy policy. This includes continuing the efforts to create a real single energy market with neighbouring countries, and eventually an integrated European market.*
- ▶ *Continue to develop scenarios as an evolving reference for considering the combined impacts of all federal and regional policies and measures.*
- ▶ *Conduct long-term quantitative studies assessing the effects of the phase-out of nuclear power and the available options to replace nuclear on energy security, environmental protection, energy prices and economic growth, and make the results publicly available and understood.*
- ▶ *Ensure that the gas and electricity grids are able to adapt to long-term changes in the generation and fuel mix.*
- ▶ *Streamline the process of planning, siting and building energy infrastructure.*
- ▶ *Take measures to reduce the dominance of the incumbent actor in the gas and electricity markets to improve competition.*
- ▶ *Give relevant regulators and authorities the necessary means to prevent anti-competitive behaviour and intervene when necessary.*
- ▶ *Review the need for four independent regulators in the electricity and gas sectors. If multiple regulators are needed, further strengthen co-ordination among them.*

- ▶ *Ensure that the transfer of responsibilities from the independent regulator to the federal government does not diminish the regulator's effectiveness.*
- ▶ *Phase out energy subsidies to consumers, including the provision of "free" electricity and other subsidies or rebates that shield consumers from accurate price signals, and instead use social policy instruments to provide economic subsidies.*

Energy and the environment

- ▶ *Give priority to the development and implementation of a National Climate Plan, which includes the calculation of emissions reduction potentials and cost-effectiveness of all policies and measures.*
- ▶ *Strive to harmonise, where possible, the policies and measures at federal and regional levels with a view to maximising their effects at national level.*
- ▶ *Ensure effective implementation and monitoring of policies and measures not covered by the EU-ETS.*
- ▶ *Ensure a balanced and cost-effective approach between developing domestic policies and measures apart from the emissions trading scheme, the government purchase of emission allowances on the international market and the allocation of emission allowances in the EU-ETS in order to meet the Kyoto target.*
- ▶ *Clarify how changes to Belgium's energy supply and demand profile due to the phase-out of nuclear power beginning in 2015 will affect CO₂ emissions, paying particular attention to how realising Belgium's significant energy efficiency potential may reduce these emissions.*

Energy efficiency

- ▶ *Continue to work to implement energy efficiency policies and measures, including those outlined in the Fraunhofer study.*
- ▶ *Strengthen monitoring of sectoral energy efficiency improvements.*
- ▶ *Ensure that standards on the energy performance of buildings are not only sufficiently stringent but also effectively implemented and enforced.*
- ▶ *Evaluate the effectiveness of the two different measures on the rational-use-of-energy public service obligations in Wallonia and Flanders and harmonise them before full energy market opening.*
- ▶ *Monitor and evaluate the cost-effectiveness of all energy efficiency measures, including voluntary agreements with industrial companies, and ensure that*

these findings are used as criteria when selecting policies and measures in the future.

- ▶ *Ensure that voluntary agreements with industry provide incentives for companies operating at energy efficiency rates that are both below and above world-class levels, as the policies intend.*
- ▶ *Ensure that CHP certificates are tradable in all regions.*
- ▶ *Further co-ordinate transport efficiency efforts across regions and the federal government.*
- ▶ *Remove fiscal policies that provide incentives for companies to purchase inefficient cars.*
- ▶ *Take necessary steps to improve private-sector investment in energy efficiency (e.g. through third-party financing by banks) by making these investments fiscally attractive.*

Renewable energy

- ▶ *Further strengthen the efforts to harmonise the federal and regional quota systems on green certificates with a goal of establishing a national green certificate market.*
- ▶ *Ensure that the differentiated minimum certificate prices do not reduce the cost-effectiveness of the certificate system.*
- ▶ *Ensure compliance of the quota obligation is not undermined by fines that are too low.*
- ▶ *Evaluate whether various support schemes can be more streamlined to maximise their cost-effectiveness.*
- ▶ *Consider the costs and benefits of promoting technologies not necessarily suited for the climate conditions in Belgium, such as solar photovoltaics.*
- ▶ *Create a comprehensive strategy and develop policies and measures – including fiscal incentives – to increase the use of biofuels in transportation.*

Oil

- ▶ *Consider removing the oil price ceiling and any other oil price regulations that may inhibit demand response to oil price spikes.*
- ▶ *Put the fund for the clean-up of soil polluted by heating oil storage tanks into operation as quickly as possible.*

Natural gas

- ▶ *Decrease as much as possible the existing structural barriers to entry to encourage new actors to enter the gas market, by promoting effective TPA to the gas network.*
- ▶ *Introduce mechanisms to reduce market concentration by, among other things, ensuring that Fluxys is completely separated from any upstream or downstream operator.*
- ▶ *Give relevant regulators and authorities the necessary means to prevent anti-competitive behaviour and intervene when necessary.*
- ▶ *Ensure stable regulations, including regulated tariffs, for transport operation and development.*
- ▶ *Consider ways to enhance security of supply by increasing market-based access to planned and existing capacity in order to encourage competition.*
- ▶ *Consider measures to decrease the strain on the domestic gas transportation system by supporting an actively traded market, through increasing volumes of domestic gas traded at the Zeebrugge hub.*
- ▶ *Eliminate the technical distinction between gas "transit" and "transportation" so that other participants can gain access to Belgium's considerable transit capacity. Belgium will thereby maintain its position as an attractive transit country.*
- ▶ *Monitor the ongoing integration of the transit system with the domestic supply system.*

Electricity

- ▶ *Harmonise regulations and obligations for retail suppliers in different regions.*
- ▶ *Continue to work with the neighbouring countries of France and the Netherlands to increase interconnection capacity and better integrate all electricity markets, with the goal of creating a more integrated European electricity market.*
- ▶ *Decrease the existing structural barriers to entry to encourage new actors to enter the electricity market.*
- ▶ *Monitor the liquidity and functioning of the forthcoming Belgian electricity exchange, Belpex, and ensure that any preconditions for a common market with neighbouring countries are met.*
- ▶ *Replace the current first-come first-served allocation of interconnection capacity with market-based mechanisms at the southern border.*

- ▶ *Ensure that mechanisms to reduce market concentration, such as VPP auctions, are regulated and conducted in a transparent and fair manner, and open to all interested parties. If VPP auctions continue to be used, consider modifying them so that their outcomes are consistent with an efficient, competitive market.*
- ▶ *Ensure multi-year and stable regulations, including regulated tariffs, for network operation and development.*
- ▶ *Ensure effective unbundling in distribution – including information technology systems – and that distribution network operators remain completely neutral toward all market participants.*

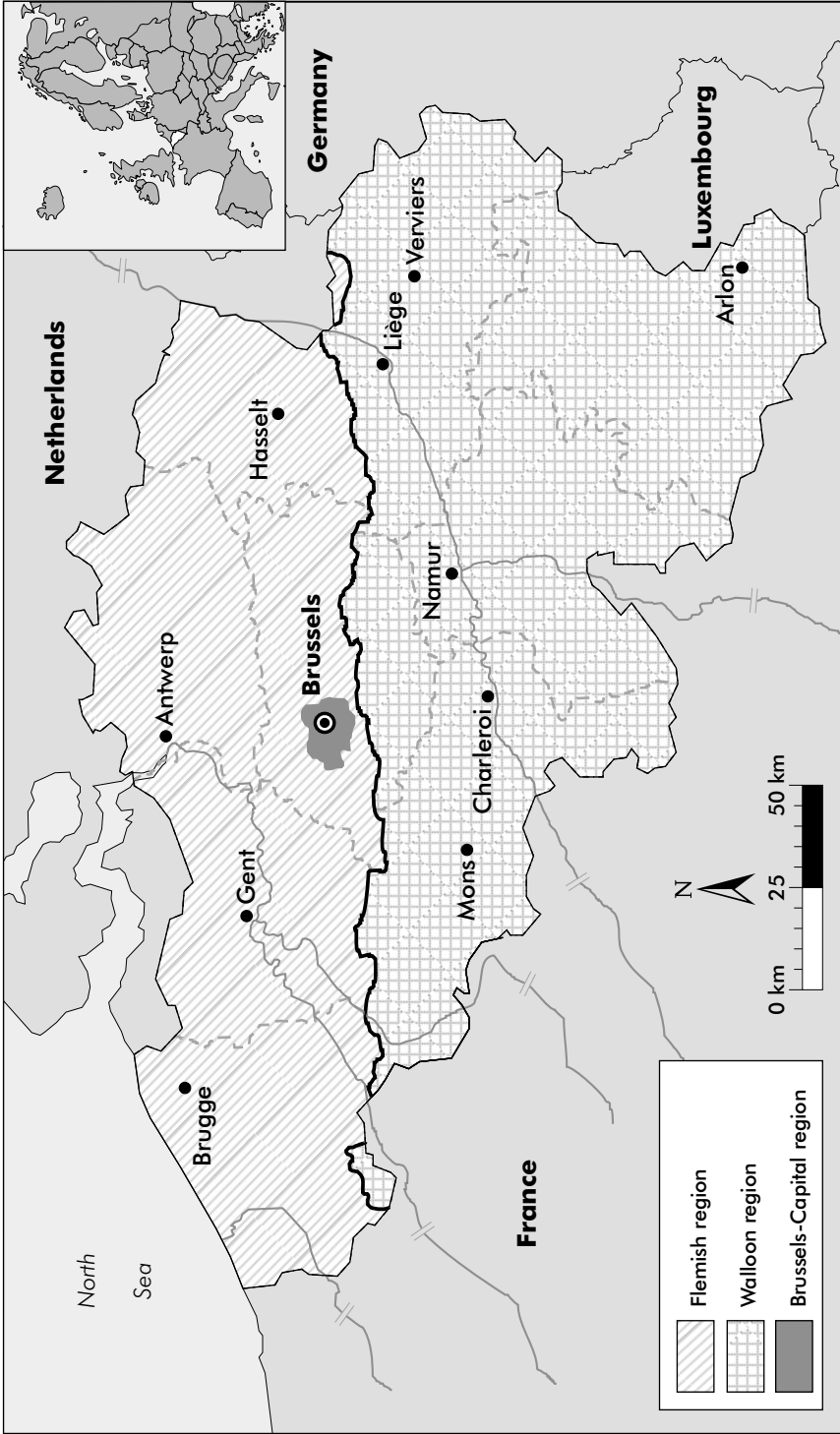
Nuclear power

- ▶ *Make preparations to preserve the ability to operate nuclear power plants after 2015 in the event of a force majeure, consistent with the law on the nuclear phase-out.*
- ▶ *Continue the education and other measures that ensure the availability of qualified personnel to staff the nuclear sector – including decommissioning and nuclear waste management activities – and relevant regulatory bodies.*

Technology, research and development

- ▶ *Enhance ex ante and ex post cost-benefit analysis of R&D activities.*
- ▶ *Enhance regional non-nuclear public-private partnership in energy R&D programmes.*
- ▶ *Enhance information exchange, co-operation, and co-ordination among regional governments in the areas of common interests, such as energy efficiency and renewables-related R&D.*
- ▶ *Develop improved processes for the collection of data on energy R&D funding and the allocation of that funding.*
- ▶ *Enhance co-ordination between the offices responsible for energy policy and science/technology policy to ensure the consistency between energy policy and energy R&D programmes.*
- ▶ *Maintain a minimum nuclear R&D capability; carefully evaluate programme requirements and funding of the SCK • CEN centre, as well as any decision to close the country's nuclear research reactor.*

Figure 1
Map of Belgium



Source: Belgian Ministry for Economic Affairs, Energy Administration.