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THE BELGIAN ENERGY LANDSCAPE: SECURITY, EFFICIENCY, AND SUSTAINABILITY

Caitlin M. Shenk



Introduction

Energy is essential for any society to function and is fundamental to the daily lives of all people. Although energy's potential for enhancing people's well-being is unquestionable, conventional energy production and consumption are closely linked to environmental degradation. The principal tension in energy policy has long been the striving for economic growth fueled by energy use on the one hand, and the desire to limit energy demand and consumption for environmental reasons on the other hand, potentially at the sacrifice of economic development. The tension between these objectives is particularly visible in Belgium.

Belgium's economic strength lies largely in its geographic position at the crossroads of western Europe, the heart of one of the world's most highly industrialized regions. In the past, this central location was often undesirable, as European powers repeatedly used it to grapple with their differences. However, in times of peace and open borders the former battlefield

of Europe was a place where trade and industry flourished. As the first European country to undergo an industrial revolution, Belgium developed an extensive transportation infrastructure to integrate its industry with that of its neighbors. Additionally, as one of the founding members of the European Community, later the European Union (EU), Belgium has been one of the foremost proponents of regional economic integration, as evidenced by its participation in the Benelux Economic Union. ("OECD Environmental Performance . . .") (See also the article by Jeremy Walsh in this issue of *Perspectives*.)

In a country as economically developed as Belgium, pressures on the environment are intense. Together with the country's delicate geographic balance between land and water, these pressures have made environmental protection a matter of serious public and political concern. Additionally, these issues have a strong international dimension in Belgium, reflecting regional economic and environmental dependencies, as well as regional vulnerability

to global environmental issues. Concern for the environment is a dominant mainstream policy issue in Belgium, as it is throughout the EU. (“OECD Environmental Performance . . .”)

Finding ways to expand its economy while simultaneously addressing the environmental impacts of energy use represents a critical challenge to Belgium. Three aspects of this challenge — energy security, energy efficiency, and energy sustainability — are particularly significant.

In this article I explain the complex energy policy environment in Belgium. I first examine the structure of Belgium’s political system and the distribution of policy responsibility in the area of energy. Next I describe various energy policy objectives outlined by different levels of the Belgian government and explore the three areas of high priority mentioned above: security, efficiency, and sustainability. Within each area, I identify key policy actions on both the federal and regional levels. Finally, I evaluate the impact of Belgium’s complex institutional structure on the country’s ability to make effective energy policy and argue that this impact is problematic for Belgium’s energy future.

Institutional Framework

Four successive revisions to Belgium’s constitution during the late 1990s established the country as a unique federal state with political power and competences (areas of responsibility) divided between the federal government, three regions, and three communities. This complex system distributes policy responsibilities, including environmental and energy policy, throughout these three levels. (“Energy Policies . . .,” 2005, p. 23)

As Belgium’s three regions — Flanders, Wallonia, and Brussels-Capital — are defined on a territorial basis, regions have powers in fields connected to their land in the widest meaning of the term, including public works and transport, land use and development planning, environmental and water policy, and housing. As Belgium’s three communities — the Flemish community, the Wallonia-Brussels community, and the German-speaking community — are defined based on concepts of culture and language, they exercise powers over

matters of individual concern, such as culture, education, the use of languages, and cooperation among language communities. The federal state remains responsible for managing everything that affects the interest of all Belgians, independent of any linguistic, cultural, or territorial considerations, including foreign affairs, military and defense, and justice. (“Belgium’s Third National Communicatio . . .,” pp. 16–17)

Energy competences are shared primarily between the federal and regional governments, with only occasional input from the communities regarding issues of environmental education and public health. The regional governments are principally responsible for developing and executing energy policies, while the federal government oversees issues that require national attention. Table 1 outlines energy policy responsibilities. (“Energy Policies . . .,” 2001, p. 19)

At the federal level, energy policy is handled by the Directorate-General for Energy within the Federal Department of the Environment. (“Energy Policies . . .,” 2005, p. 27) The Ministries of Public Health and the Environment, Mobility and Transport, and Economic Affairs also share energy policy responsibilities relating to environmental, transportation, and economic issues, respectively. Belgium’s overall energy policy objectives have focused on security of supply, energy efficiency, and environmental sustainability. (“Energy Policies . . .,” 2001, p. 20)

Regional energy policies tend to focus on energy efficiency and the introduction of renewable energy sources, for both energy security and sustainability reasons. Additionally, regions aim to increase public awareness of energy issues. In Flanders, energy policy responsibility is shared by the Division of Natural Resources and Energy within the Administration of the Economy and the Department of Environment and Infrastructure within the Administration of the Environment. In Wallonia, energy matters are handled by the Directorate-General for Technology, Research, and Energy and the Directorate-General for Natural Resources and the Environment. Additionally, the Ministry of Equipment and Transportation also assists with transportation policy. In Brussels-Capital, the Brussels Institute for the Management of the

Table 1
Division of Energy Policy Responsibilities

Federal government	Regional governments
<ul style="list-style-type: none"> • Security of supply • Investment plans for gas and electricity (in collaboration with the Commission for Gas and Electricity Regulation) • Production and transmission/transport of energy (electricity grid > 70 kV) • Nuclear power and related R&D • Large stockholding installations • Tariffs and prices • Product norms and standards 	<ul style="list-style-type: none"> • Regulation of gas and electricity markets • Public distribution of natural gas • District heating equipment and networks • Production and transmission/transport of electricity (electricity grid < 70 kV) • New and renewable sources of energy (except nuclear) • Recovery of waste energy from industry or other uses • Promotion of the efficient use of energy

Source: "Energy Policies . . .," 2005, p. 26.

Environment is responsible for all energy policy matters. ("Energy Policies . . .," 2005, pp. 24, 28)

Belgium's governmental structure requires the coordination of energy policy both between the federal and regional governments and across the regions. Sixteen inter-ministerial conferences, including the Inter-ministerial Conference for the Environment (ICE), have been set up to this end. The ICE is devoted to matters requiring intergovernmental cooperation for environmental policy development and implementation. ("OECD Environmental Performance . . .," p. 140) ICE decisions are prepared and executed by the Coordination Committee for International Environmental Policy (CCIEP), whose main task is to ensure that Belgium speaks with one voice at the international level. ("Fourth National Communication . . .," p. 13) Additionally, the energy consultation group CONCERE/ENOVER is a body for energy policy coordination that was created in 1991 by Belgium's central and regional governments. CONCERE/ENOVER does not have power to regulate, but rather provides recommendations to Belgian regulatory bodies and facilitates cooperation and information exchange among federal and regional governments, as well as internationally. ("Energy Policies . . .," 2005, p. 29)

Energy Security

Energy security means the availability of energy at all times in various forms, in sufficient quantities, and at affordable prices, and is a key priority in Belgian energy policy. Over 97 percent of Belgium's total primary energy supply (TPES) comes from four main sources — coal, oil, gas, and nuclear power. ("Energy Policies . . .," 2005, p. 32) With the exception of nuclear power and a small share of renewable energy, however, this energy supply depends on imports, as Belgium has limited resources for domestic energy production. Belgium imports 78.9 percent of its TPES, a figure significantly above the EU-27 average of 50.1 percent. ("Belgium Energy Mix . . .," p. 1) The country has indigenous coal resources, but the government closed all mines due to high costs of production. Domestic production is limited to nuclear energy, with a small share from renewable resources. ("Energy Policies . . .," 2005, p. 32) Table 2 compares domestic production and net imports of Belgium's energy supply, in megatons (Mt) of energy.

In 2004, 11 percent of Belgium's TPES came from solid fuels, primarily coal. However, overall consumption of solid fuels has been gradually decreasing since 1990, due to closures of domestic coal mines and increased emissions

Table 2
Key Energy Supply Figures, 2004

<i>Units: Megatons (Mt) of energy</i>	Domestic production	Net imports
Solid fuels	0.1	6.2
Oil	0	27.7
Natural gas	0	14.6
Nuclear	12.2	0
Renewables	1.0	0.2

Source: "Belgium Energy Mix Fact Sheet," p. 1.

regulations. Since coal is one of the most polluting sources of energy available, this transition away from coal is an important one. Solid fuel imports originate primarily from South Africa and Australia. ("Belgium Energy Mix . . .," pp. 1–2)

Oil dominates Belgium's TPES at 37 percent. Oil makes up most of Belgium's energy imports, coming primarily from Russian and Middle Eastern countries. ("Belgium Energy Mix . . .," pp. 1–2) However, Belgium's oil supply is now relatively diversified, with no more than 35 percent coming from any one country. This is in contrast to previous years, such as 1979, when OPEC countries provided 87 percent of Belgium's oil supply. That figure fell to 34 percent in 1999 and to 31 percent in 2004. ("Energy Policies . . .," 2005, pp. 29, 107)

Natural gas comprises Belgium's second largest source of energy at 27 percent of the country's TPES. ("Belgium Energy Mix . . .," p. 1) Given recent increased demand, the security of Belgium's natural gas supply is particularly important. Natural gas is gradually replacing hard coal in Belgium's TPES, imported from the Netherlands (31 percent), Norway (35 percent), Algeria (18 percent), and the United Kingdom (12 percent). Natural gas is also expected to be the primary replacement when nuclear power is phased out, as will be discussed below. Belgium's location linking gas producers to its north and west, and gas markets to its south and east, makes the country an important transit country, as well. ("Energy Policies . . .," 2005, pp. 30, 119)

Nuclear power was first introduced in Belgium in 1975. ("Energy Policies . . .," 2001,

p. 23). The most recent of the country's seven power plants was completed in 1985. Since that time, successive governments have acted to limit and eventually eliminate nuclear power in Belgium. ("Status of Nuclear . . .") Because nuclear energy presently supplies 22 percent of Belgium's TPES and 92 percent of its domestic energy, Belgium will be faced with a significant supply gap in the absence of nuclear power, which is likely to be filled by increased imports. The phase-out could have a significant adverse impact on Belgium's current efforts in the areas of energy security, climate change mitigation, and economic growth. ("Belgium Energy Mix . . .," p. 1) While the federal decision to eliminate nuclear power should have positive impacts on environmental safety and health, implementation of such policy without a plan for replacement will negatively impact energy security in Belgium and will place significant pressure on the regions to compensate for the resulting supply gap. Coordination of policy between the federal and regional governments is essential for a successful phase-out of nuclear power.

In 2004 renewable energy contributed 2 percent of Belgium's TPES, below the EU average of 6 percent. ("Belgium Energy Mix . . .," p. 1) By 2020 the EU hopes to increase its overall share of renewables to 20 percent. In order for this broader EU target to be achieved, Belgium has been assigned a target of 13 percent by 2020. Targets differ among Belgium's three regions, as does implementation of national and regional renewable energy policies. Wallonia aims to increase its share from 2 percent in 2000 to 8 percent in 2010, and Flanders from 2 percent in 2004 to 6 percent in

2010. Due to the small size and limited renewable energy facilities in Brussels-Capital, increased consumption of renewables in that region will have a relatively minimal impact on overall consumption. All three regions, as well as the federal government, have introduced programs that require energy suppliers to use renewable sources for a portion of their product. In addition, all three regions have introduced fiscal incentives to foster renewable resource use. (“Energy Policies . . . ,” 2005, pp. 89–102) While federal and regional governments each have policies in place to encourage renewable energy, their potential for success is limited. Belgian governments share the common goal of increased use of renewables, but the likelihood of this goal being achieved would increase significantly if policies were coordinated.

Energy Efficiency

Energy efficiency in Belgium and its regions, a second priority in energy policy, is low in comparison both to other European countries as well as to the EU average, as is evident in its relatively high energy intensity, energy use per capita, and CO₂ emissions per capita. (“Belgium Energy Mix . . . ,” p. 1) These indicators appear in Table 3. In Belgium, energy accounts for 81 percent of total greenhouse gas (GHG) emissions. (“Energy Policies . . . ,” 2005)

Energy efficiency has become a double priority for two reasons: first, to control increasing risks relating to energy supply security and second, to achieve necessary cuts in GHG emissions. Responsibility for energy efficiency in Belgium belongs primarily to the regional governments. The federal role is largely limited to implementing fiscal incentives, coordinating regional activity, and aligning internal policies with EU and international objectives. (“Energy

Policies . . . ,” 2001, pp. 46, 57) Federal and regional governments share policy responsibility in the areas of energy performance in buildings and transportation, and regional governments alone regulate industrial efficiency. However, federal and regional policies lack coordination, making it difficult for a cohesive national approach to energy efficiency to emerge. While policies in these three areas share common objectives, their articulation and implementation differ significantly.

Federal Government

Energy performance in buildings is a key concern for both federal and regional governments. At the federal level, tax deductions are granted for household energy savings. Additionally, the federal government provides financial support for energy efficiency projects in public buildings and low income households. (“Energy Policies . . . ,” 2005, p. 72; “OECD Environmental Performance . . . ,” p. 126) Also enforced is the EU directive on labeling of household appliances to increase consumer awareness of household energy consumption. (“Energy Policies . . . ,” 2005, p. 72)

In addition to promoting efficient energy use in buildings, Belgium’s federal government also employs a variety of policies to counter the country’s staggering growth in vehicle transport and ownership rates, including tax reductions on less polluting vehicles, financial support for commuting costs, promotion of transportation shifts from roads to trains and ships, and mandated replacement of existing federal vehicle fleets with environmentally-friendly vehicles. The EU directive on fuel economy of passenger vehicles, which requires the introduction of energy labels, has also been implemented at the federal level. (“Energy Policies . . . ,” 2005, pp. 72–79)

Table 3

Key Energy Indicators, 2004

	Belgium	EU-27
Energy intensity (TPES/GDP)	205	185
Energy use per capita	5,263	3,689
CO ₂ emissions per capita (kg/capita)	10,773	8,180

Source: “Belgium Energy Mix Fact Sheet,” p. 1.

Wallonia

In the industrial sector, Wallonia relies on voluntary agreements to increase efficiency. Participating companies commit to developing energy efficiency plans and providing annual reports to the regional government. In exchange, they benefit from tax subsidies and exemptions from other energy efficiency requirements such as CO₂ taxes. (“OECD Environmental Performance . . . ,” p. 127) A total of 117 energy-intensive companies are participating in this voluntary agreement scheme, accounting for over 90 percent of Wallonia’s industrial energy consumption and 47 percent of the region’s total energy consumption. Wallonia has also implemented a number of financial incentives for industrial energy efficiency, enabling industries to evaluate their energy consumption and efficiency more affordably. (“Energy Policies . . . ,” 2005, p. 75)

Walloon policies on energy efficiency and performance in buildings primarily take the form of financial incentives for energy efficient investments. (“Energy Policies . . . ,” 2005, p. 77) In addition, the region has several programs that offer subsidies to low-income households, municipal buildings, schools, and hospitals for energy efficiency improvements. (“World Energy Outlook”) Wallonia has also implemented public education and awareness campaigns related to energy efficiency in buildings, including professional training programs for architects, building contractors and workers, and educators. (“Energy Policies . . . ,” 2005, p. 77)

In the transport sector, Wallonia is engaged in a number of energy efficiency efforts. A 2004 decree established the framework and funding for a mobility plan in cooperation with the region’s municipalities. (van Hecke and Zgajewski, p. 26) In another program, forty-four schools from nine municipalities are involved in encouraging parents, students, teachers, and others to select non-vehicle transportation to school. Similar to this program, Wallonia also actively supports company mobility plans. The Walloon government also works to encourage use of public transportation by reducing fares and sponsoring public accessibility campaigns (“Energy Policies . . . ,” 2005, p. 80)

Flanders

In the industrial sector, Flanders’ energy efficiency efforts rely on two kinds of voluntary approaches: benchmarking covenants and audit covenants. Benchmarking covenants apply to large energy-intensive companies that fall under the EU Emissions Trading Scheme (EU ETS), while audit covenants apply to medium-sized energy-intensive companies that do not fall under the EU ETS. These covenants mandate participating companies to maintain an optimal level of energy efficiency, in exchange for exemptions from additional energy efficiency requirements. (“Energy Policies . . . ,” 2005, pp. 73–74) Belgium anticipates an improvement of 7.8 percent in overall energy efficiency by 2012 in comparison to 2002 as a result of these agreements. (“OECD Environmental Performance . . . ,” pp. 126–27)

In the buildings sector, the Flemish government approved the Energy Performance Act in 2004, providing the bases for minimum performance standards and energy certificates for buildings. This legislation affects insulation, ventilation, and overall energy performance of new buildings and of expansions to existing buildings. (“Addressing Climate Change”) Flanders also encourages efficient energy performance in buildings through financial incentives and community education programs. (“Energy Policies . . . ,” 2005, pp. 76–77)

Regarding the transport sector, Flanders approved a set of policy recommendations in 2003, highlighting five main goals to meet the objective of sustainable transportation. These goals include increased and improved transportation alternatives, improvements in infrastructure, efficient use of existing transportation modes and infrastructure, and shifts toward environmentally-friendly driving. (“Addressing Climate Change”) To encourage implementation, the government has embraced public awareness and education campaigns. (“Energy Policies . . . ,” 2005, p. 80)

Brussels-Capital

Unlike the Flemish and Walloon regions, Brussels-Capital has a small industrial sector, accounting for just 4 percent of Belgium’s over-

all consumption. Consequently, the region has a limited program on industrial energy efficiency. Unlike the voluntary agreements implemented in Flanders and Wallonia, Brussels-Capital has introduced a voluntary program called "Eco-dynamic enterprise," under which an entrepreneur signs a charter outlining principles of ecological management and energy efficiency. ("Energy Policies . . .," 2005, p. 76) As of 2006, there were seventy-nine signatories to the charter. (van Hecke and Zgajewski, p. 30)

In Brussels-Capital, emphasis is put on the energy efficiency of buildings, as the household and service sectors are the region's greatest energy consumers. ("Energy Policies . . .," 2001, p. 46) Existing building regulations include minimum energy performance criteria for buildings built or renovated since 2000. ("OECD Environmental Performance . . .," p. 128) Additionally, Brussels is in the process of requiring energy efficiency certifications for buildings. The region also provides subsidies to individuals, municipalities, schools, and hospitals for energy efficiency investments. ("Energy Policies . . .," 2005, pp. 77–78; "Addressing Climate Change . . .")

Brussels' efforts to increase transportation efficiency center on promoting use of the region's public transportation system. ("Energy Policies . . .," 2005, p. 81) In 1998 the region implemented its first mobility plan, called the "IRIS Plan," with the objective of stabilizing rush hour commutes for 2005 at 1991 levels. This plan has not, however, reached its objective. The study of a new IRIS plan began in 2002, but no new plan has been drafted. (van Hecke and Zgajewski, p. 29) In 2006 the Brussels region adopted the "Brussels Air Allowance," aimed at reducing atmospheric pollution by encouraging motorists to give up their cars in favor of more environmentally-friendly travel, such as public transportation, bicycling, walking, and carpooling. ("Prime Bruxell'Air") In exchange for giving up their license plates or having their cars destroyed, individuals can receive subscriptions to public transportation. (van Hecke and Zgajewski, p. 30) Brussels also requires all enterprises with more than 200 employees to implement plans to improve efficiency of employee transportation. ("World Energy Outlook . . .")

Energy Sustainability

Environmental sustainability is a third priority in Belgian energy policy. Belgium has ratified both the United Nations Framework Convention on Climate Change (UNFCCC) and the Kyoto Protocol and, in order to meet its obligation under these international agreements, has agreed to reduce GHG emissions by 7.5 percent below 1990 levels during the 2008–2012 period. ("Belgian National Allocation . . .," 2006, p. 6) This means that relative to 1990 levels, Belgium will have to reduce emissions from 146.9 million tons of CO₂ equivalents (MtCO₂eq) to 135.9 MtCO₂eq. (van Hecke and Zgajewski, p. 5) Since CO₂ is the most prevalent of greenhouse gases, CO₂ equivalents provide a universal standard of measurement against which the impacts of releasing different greenhouse gases can be evaluated. Through a 2004 internal burden-sharing agreement between federal and regional governments, the three regions have different emissions reductions targets, as indicated in Table 4. During the target period, Wallonia will reduce its emissions by 7.5 percent and Flanders by 5.2 percent, while Brussels-Capital can increase its emissions by 3.5 percent, relative to 1990 levels. ("OECD Environmental Performance . . .," p. 132) Under this agreement, more allowances are assigned to the regions than Belgium is assigned under Kyoto. The federal government will fill this gap through the purchase of emissions credits on the international market. ("Energy Policies . . .," 2005, pp. 53–54) Each region has developed a climate plan to meet its respective target, and the federal government has adopted additional policies, including a comprehensive national climate plan, to support regional efforts. ("OECD Environmental Performance . . .," p. 133) Despite the fact that there appears to be cohesiveness in this division of reduction targets, the implementation of policies to meet these targets varies significantly and weakens the potential for success.

Belgium is also a party to the EU ETS, a cap and trade emissions market that the EU is using to meet its Kyoto objective. ("Energy Policies . . .," 2005, p. 62) The EU ETS is focused initially on big industrial emitters that collectively produce almost half of the EU's CO₂ emis-

Table 4**Internal Belgium Burden-Sharing Agreement to Meet Kyoto GHG Commitment**

<i>Units: MtCO₂eq</i>	1990 GHG emissions	2008–2012 GHG emissions (annual)	Change from 1990
Wallonia	54.3	50.2	–7.5%
Flanders	88.0	83.4	–5.2%
Brussels-Capital	4.0	4.1	+3.475%
Total	146.2	137.7	–5.8%
Kyoto commitment	146.2	135.3	–7.5%
Difference from Kyoto commitment (to be purchased by federal government)		2.5	

Source: “Energy Policies . . . ,” 2005, p. 54.

sions. (“EU Emissions Trading . . . ,” p. 4) Participating companies are allocated a quantity of annual CO₂ emission allowances, which can be bought and sold as needed to balance actual annual emissions. (“OECD Environmental Performance . . . ,” p. 133) To implement the EU ETS, each country establishes a National Allocation Plan, dividing its total emissions budget between the energy and industrial sectors. In view of the distribution of competences in Belgium, four distinct allocation plans have been drawn up. (“Energy Policies . . . ,” 2005, pp. 62–63) More than 300 Belgian companies participate in the EU ETS, accounting for 40 percent of the country’s CO₂ emissions. (van Hecke and Zgajewski, p. 9)

Federal Government

In 2002 Belgium’s federal and regional governments adopted the National Climate Plan 2002–2012, which proposes various GHG reducing measures. These measures include increased tax deductions for energy efficiency, the development of more efficient transportation, the conversion of two power stations from coal to biomass, the construction of a windmill park, the introduction and encouragement of biofuels, and tax relief for environmentally-friendly cars. (“Belgian Progress Report . . . ,” p. 6) In conjunction with the National Climate Plan, the federal and regional governments created the National Climate Commission (NCC) for the plan’s implementation. (“Belgian National Allo-

cation . . . ,” 2006, p. 5) The Commission is responsible for continuous coordination of policies by the federal and regional governments, including the existing burden sharing agreement, the evaluation of national and regional climate plans, and the implementation of Belgium’s international obligations. (van Hecke and Zgajewski, p. 7)

In addition, the federal government adopted a new version of the Federal Plan for Sustainable Development in 2004, defining federal measures to achieve sustainable development objectives. One of the plan’s six areas of action is the “limitation of climate change and more intensive use of clean energy.” This theme prescribes five actions, including strengthening policy coordination, establishing fair energy prices, fostering EU solidarity, promoting alternative energy, and promoting energy efficient buildings. (“OECD Environmental Performance . . . ,” p. 56)

Wallonia

The internal burden-sharing agreement mandates that Wallonia reduce its GHG emissions by 7.5 percent compared to its 1990 level for the 2008–2012 period, a decrease from 54.8 MtCO₂eq in 1990 to 50.7 MtCO₂eq in 2008–2012. (van Hecke and Zgajewski, p. 21) GHG emissions in Wallonia have already declined from 54.8 MtCO₂eq in 1990 to 50.6 MtCO₂eq in 2003, a decrease of 6.8 percent, demonstrating overall progress toward the

region's commitment. ("Energy Policies . . .," 2005, p. 57) A significant part of this decrease is due to the closing of many iron and steel furnaces and coke refineries, as well as to the transition to natural gas. Additionally, the development of methane recovery and the growing use of biomass fuels have contributed to this trend. However, despite this positive trend, emissions from transport and heating have continued to grow, as they have in Flanders and Brussels-Capital. (van Hecke and Zgajewski, p. 21)

In 2001 the Walloon government adopted the Walloon Region Action Plan for Climate Change, containing eighty-nine measures affecting all GHG emitting sectors and aiming at short-, medium-, and long-term reduction actions. (van Hecke and Zgajewski, pp. 21–22) This plan was later integrated into the 2003 Walloon Air Plan, which describes the region's policy of controlling emissions and includes international commitments such as the Kyoto Protocol. ("Belgian National Allocation . . .," 2004, p. 109) The Walloon plans for climate and air eventually evolved into Wallonia's 2007 Air-Climate Plan, which contains eighty-two priority measures covering all sectors of human activity. (van Hecke and Zgajewski, p. 22) With its Air-Climate Plan, the Walloon region intends to go beyond its Kyoto commitment of a 7.5 percent reduction by reducing its GHG emissions by 10 percent. The Walloon government has also set targets of increased renewable energy use and an overall reduction in energy consumption. ("Belgian Progress Report . . .," p. 6)

Flanders

GHG emissions in Flanders increased from 88 MtCO₂eq in 1990 to slightly over 91 MtCO₂eq in 2003, an increase of 3.6 percent. The transport and industry sectors were primarily responsible for this rise. ("The Flemish Climate . . .," p. 25) Considering Wallonia's decline in emissions between 1990 and 2003 and Brussels-Capital's comparatively small share of overall emissions, the most drastic reductions will have to be made by Flanders in order for Belgium to meet its Kyoto commitment. ("Energy Policies . . .," 2005, p. 56) In accordance with the internal burden-sharing agreement, the Flemish region must reduce its emissions by 5.2 percent in the period 2008–2012

compared to 1990 levels. ("Belgian National Allocation . . .," 2004, p. 6)

In 2001 the Flemish government established the Flanders Climate Policy Taskforce to develop and implement a regional climate policy. The 2002–2005 Flemish Climate Policy Plan (FCPP) foresaw a stabilization of GHG emissions in 2005 at 1990 levels. While this objective was not reached, the Flemish region took the lessons learned from its first attempt and applied them to its next FCPP. In preparation of the second FCPP, Flanders established the Flemish Climate Conference, with the intention of more actively involving economic, social, environmental, and political sectors in policy discussions. Government and target groups signed a declaration of commitment both to support Belgium's Kyoto objectives and to contribute to the development of a long-term strategy for emissions reductions after Kyoto. Working groups discussed such key sectors as transport, buildings, energy production, agriculture, and industry, and the resulting recommendations were incorporated in the second FCPP, introduced in 2005. Its key objectives are the following: the achievement of the Flemish Kyoto target; the continued elaboration of a Flemish strategy for climate policy; the creation of the basis for further reductions after 2012; and the continued development of new policy instruments. ("The Flemish Climate . . .")

Brussels-Capital

Emissions in Brussels are difficult to compare with those in Flanders and Wallonia. In Brussels-Capital, the residential sector accounts for the largest percentage of emissions (48 percent), followed by the service sector (24 percent) and transport (19 percent). While the energy and industry sectors contribute half of Belgium's overall emissions, these sectors represent a mere 3 percent of emissions in Brussels-Capital, due to its comparably low level of industry. ("Belgian National Allocation . . .," 2004, p. 73) According to the internal burden-sharing agreement, Brussels-Capital can increase emissions by 3.475 percent for the 2008–2012 period compared to its 1990 levels, demonstrating that within Belgium GHG emissions in the Brussels-Capital region are negligible when compared to those of Flanders and

Wallonia. ("Belgian National Allocation . . .," 2004, p. 6)

In 2002 the Brussels-Capital government adopted an eight-year air and climate plan, containing eighty-one policy prescriptions. ("Energy Efficiency Policies . . .," p. 9) Air and climate issues are combined in this plan because as a city Brussels' sources of atmospheric pollutants are also its sources of GHG emissions. (van Hecke and Zgajewski, p. 27) In order to improve implementation and follow-up of the Brussels-Capital regional plan, the region created a Kyoto Platform in 2005 composed of representatives from the entire regional government. ("Fourth National Communication . . .," p. 14)

Conclusion

Belgium has experienced substantial economic development in recent decades. However, this growth has been accompanied by an even greater increase in pressures exerted on the environment. Despite some progress, Belgium's overall energy intensity is well above the EU average, as well as above rates in neighboring countries. In this context, making development both economically and environmentally sustainable is a challenge. While energy is recognized as crucial for economic and social well-being, it is also seen as creating obstacles to environmentally-friendly growth. ("OECD Environmental Performance . . .")

Since Belgium evolved into a federal state of three regions and three communities, policy responsibilities have been defined and divided, and administrations at all levels of government have done a great deal in the areas of energy security, energy efficiency, and energy sustainability. However, under a complex division of responsibilities between the federal and regional governments, it is challenging to achieve national energy policy goals.

Under Belgium's division of policy responsibilities between the federal and regional governments, energy policies involve many different players. Consequently, energy policy making is inevitably complex, making it challenging to achieve cohesive policy. This can reduce the efficiency and the effectiveness of the energy sys-

tems of Belgium as a whole. While the federal and regional governments have developed a variety of energy policy plans, they lack cohesion and consistency. Better policy integration across the regions of Belgium and between the regional and federal governments would ensure that the various plans are consistent, mutually supportive, and well implemented. Additionally, harmonization would not only strengthen the country's energy efforts but would also facilitate integration with its neighboring countries and with the larger European Union.

At the federal level, energy policy is limited to financial incentive and disincentive programs. However, financial incentive and disincentive programs do not provide a sufficiently strong base for a cohesive national framework. While these programs are a starting point, they are severely limited in scope and to be successful depend largely on an active and informed general population. In addition, such financial programs can only go so far; to move forward, Belgium must develop a stronger, more diverse policy portfolio at the federal level. At the regional level, Flanders, Wallonia, and Brussels-Capital have articulated similar policy goals but strive to meet them in very different ways. Belgium's internal division makes the policy environment difficult to navigate and ultimately less effective than it could be. Belgium needs a common energy policy in order to confront the multiple and linked challenges ahead for supply security, energy efficiency, and environmental sustainability.

In the Belgian and EU contexts, harmonization of environmental and energy policies in the three regions is progressing. However, improved coordination within the federal government, between federal and regional governments, and within each regional government will demand further time, effort, and political will. Energy policy development and integration should be continued so as to produce a more coherent policy framework, delineate competences more clearly, avoid overlaps in policy responsibility, clarify the obligations of all parties in both national and international contexts, and maximize synergies between federal and regional administrations.

REFERENCES

- "Addressing Climate Change Database." International Energy Agency. Online. www.iea.org/textbase/pm/index_clim.html. Accessed January 5, 2008.
- "Belgian National Allocation Plan." 2004. Online. ec.europa.eu/environment/climat/pdf/belgium_en.pdf. Accessed February 22, 2008.
- "Belgian National Allocation Plan for CO₂-Emission Allowances 2008–2012." 2006. Online. ec.europa.eu/environment/climat/pdf/nap_belgium_final.pdf. Accessed February 7, 2008.
- "Belgian Progress Report on the Implementation of the Renewed EU Sustainable Development Strategy." Belgian Federal Public Planning Service for Sustainable Development. 2007. Online. ec.europa.eu/sustainable/docs/report_2007_be.pdf. Accessed March 13, 2008.
- "Belgium Energy Mix Fact Sheet." 2007. Online. ec.europa.eu/energy/energy_policy/doc/factsheets/mix/mix_be_en.pdf. Accessed October 27, 2007.
- "Belgium's Third National Communication under the United Nations Framework Convention on Climate Change." 2002. Online. unfccc.int/resource/docs/natc/belnc3.pdf. Accessed November 21, 2007.
- "Energy Efficiency Policies and Measures in Belgium." 2007. Online. www.odyssee-indicators.org/Publication/PDF/nr_belgium_2006.pdf. Accessed April 2, 2008.
- "Energy Policies of IEA Countries: Belgium." International Energy Agency. 2005. Online. www.iea.org/textbase/nppdf/free/2005/belgium2005.pdf. Accessed July 15, 2007.
- "Energy Policies of IEA Countries: Belgium." International Energy Agency. 2001. Online. www.iea.org/textbase/nppdf/free/2000/belgium2001.pdf. Accessed July 17, 2007.
- "EU Emissions Trading: An Open System Promoting Global Innovation." 2007. Online. ec.europa.eu/environment/climat/pdf/emission_trading2_en.pdf. Accessed February 22, 2008.
- "The Flemish Climate Policy Plan 2006–2012: The Climate Is Changing. Are You Changing Too?" 2006. Online. www.lne.be/themas/klimaatverandering/klimaatconferentie/vlaams-klimaatbeleidsplan-2006-2012/flemish-climate-policy-plan-2006-2012/070124_english_version_versie_website.pdf. Accessed October 6, 2007.
- "Fourth National Communication on Climate Change under the United Nations Framework Convention on Climate Change." 2006. Online. unfccc.int/resource/docs/natc/belnc4.pdf. Accessed December 20, 2007.
- "OECD Environmental Performance Reviews: Belgium." Organisation for Economic Co-operation and Development. 2007.
- OECD Working Party on Environmental Performance. "Conclusions and Recommendations: 32 Countries (1993–2000)." 2000. Online. www.oecd.org/dataoecd/19/56/2432829.pdf. Accessed April 8, 2008.
- "Prime Bruxell'Air." Online. www.prime-bruxellair.be. Accessed March 17, 2008.
- "Status of Nuclear in Current Member States." Online. www10.antenna.nl/wise/index.html?http://www10.antenna.nl/wise/596-8/h3.php. Accessed April 11, 2008.
- van Hecke, Karel and Tania Zgajewski. "The Kyoto Policy of Belgium." 2008. Online. www.irri-kiib.be/papereg/ep18.pdf. Accessed February 1, 2008.
- "World Energy Outlook Database." International Energy Agency. Online. www.iea.org/Textbase/pm/?mode=weo. Accessed January 5, 2008.