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From: The Secretary

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WAGE INDEXATION AND INTERNATIONAL COMPETITIVENESS IN BELGIUM: AN UNEASY COEXISTENCE[1]

Belgium is one of a small group of euro area countries that maintains indexation of wages to inflation as part of its wage-setting framework. With intensified price pressures since late 2020 driving inflation to record levels, the tension between compensating workers for purchasing power losses while maintaining international competitiveness have again been highlighted. Against this background, this paper surveys key drivers of the recent surge in inflation and outlines salient features of Belgium's wage-formation process. It then tries to identify some weaknesses and policy recommendations that strive to strike a balance between maintaining benefits of wage indexation while attenuating drawbacks for the economy.

A. Introduction

1. With previous inflationary episodes having faded into the distant past, the recent reemergence of price pressures is of a historical magnitude. By December 2022, annual headline inflation in Belgium, as measured by the HICP index, reached 10.2 percent, following a peak of 13.1 percent in October. This far surpassed a high of 5.9 percent set in 2008, as the result of a run-up of global commodity prices at that time.[2] Likewise, core inflation, which excludes products with more volatile price fluctuations, such as energy or unprocessed food, accelerated to an annual rate of 7.1 percent, indicating a much broader degree of inflationary pressures than in 2008 and putting to an end a remarkable period of price stability lasting from 2011 to 2021. In a wider euro area context, Belgium is not unique. Since end-2020, its headline inflation rate has risen by 9.9 percentage points, exceeding earlier highs in inflation, like other euro area countries. In addition, the inflation increase in Belgium has been comparable to developments in two of its three main trading partners (France, Germany, and the Netherlands)[3], with price caps maintained in France to contain the impact of the energy crisis on consumers chiefly accountable for the considerably lower rise in inflation there. At the same time, inflation in Belgium has generally stayed below surges in prices in some other small open euro area economies, such as Slovakia, Slovenia, or the Baltic countries.

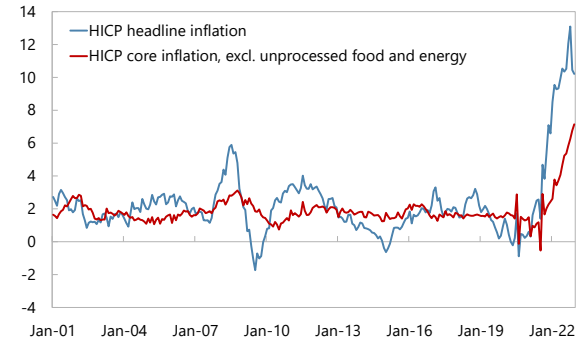
[1] Prepared by André Geis (EUR), with helpful comments and suggestions by Mark Horton (EUR) and staff of the National Bank of Belgium and the Federal Planning Bureau.

[2] Unless stated otherwise, the subsequent analysis focusses on developments in the harmonized index of consumer prices (HICP), an indicator that has been standardized across the European Union to ensure better comparability of consumer price inflation among countries. Like many other EU economies, Belgium also maintains a national consumer price index (CPI). By and large, the CPI tracks the HICP closely but does not yield identical rates of inflation in each and every month. Particularly during periods of elevated inflation, as at present, gaps can be sizeable, largely reflecting statistical differences, such as the weighting schemes employed to products that enter the consumer baskets underlying the HICP and the CPI.

[3] Based on IMF data, the three countries accounted for 45 percent of Belgium's merchandise exports in 2021, with shares of 19 percent (Germany), 14 percent (France) and 12 percent (the Netherlands).

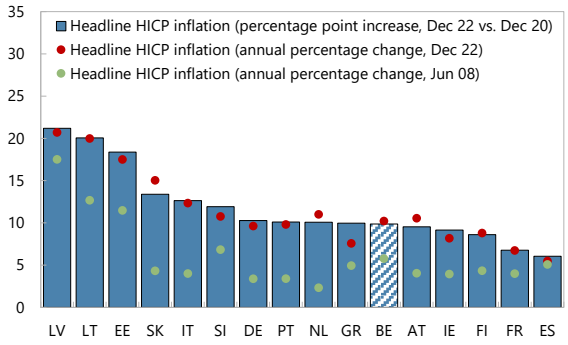
Belgium: Inflation Developments

HICP Inflation
(Annual percentage changes)



Sources: StatBel and IMF staff calculations.

HICP Headline Inflation
(Annual percentage changes, percentage points)



Sources: Eurostat and IMF staff calculations.

2. Inflation at record levels is putting the sustainability of Belgium's wage indexation system to the test by weighing on corporate and government finances. Almost uniquely among euro area countries, the indexation of base pay to price developments is nearly universal in Belgium, applying in equal measure across firms, industries, and the public sector.[4] Wage indexation has its advantages, as it cushions the blow of higher prices on the purchasing power of consumers to a considerable extent, even if some parts of the workforce, most notably the self-employed, do not enjoy its benefits. Moreover, in the present circumstances of an energy price shock draining household demand for other goods and services, the burden of fiscal policy to compensate for the fall in purchasing power should be eased by indexation of wages, opening the door to target government support to the most vulnerable groups, rather than opting for broad-based measures. A terms-of-trade shock like the current climb in commodity prices involves a rise in nominal imports and a loss that needs to be borne by households, corporations, or the government. In Belgium, this loss is disproportionately stemmed by firms and the government in the moment, which ceteris paribus, are bearing the costs of indexed wages.[5] Furthermore, the increase in labor compensation due to indexation is usually a permanent cost factor. Although a passthrough of falling prices to lower wages is possible, in principle, nominal wages rarely adjust downward, even if the worsening of the terms-of-trade should reverse and the additional expenses on employees cannot be passed on to sales prices.

3. Worsening corporate and government finances due to wage indexation-related cost pressures may have pernicious side effects. For the government, a corollary of higher expenditures due to public sector wage and social benefit indexation is commonly higher nominal revenues, e.g., from VAT or income tax brackets not being adjusted for inflation. This may soften the budgetary impact. Still, indexation has an opportunity cost as it absorbs revenues that could be directed to other priority areas of government spending. Companies face a more challenging

[4] The other euro area countries that uphold comparable wage indexation arrangements are Cyprus, Luxembourg, and Malta. For on overview of the prevalence of private-sector wage indexation in the euro area, see Grapow and Koester (2021).

[5] In addition, social benefits are also indexed to inflation, creating further pressure on government expenditures.

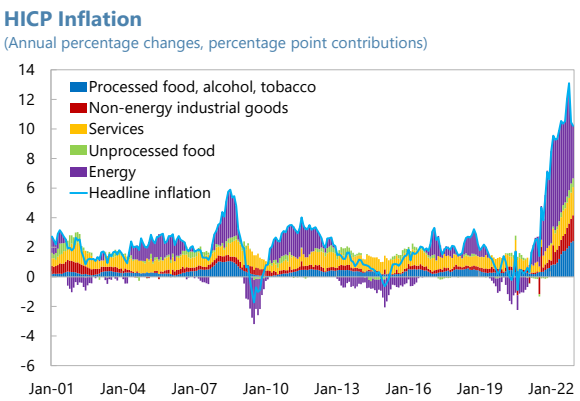
conundrum. Choosing to keep sales prices stable will cut into profitability, lowering future investment or even threatening solvency, particularly when being confronted with a twin shock of higher labor and other input costs. Passing cost pressures on to consumers may preserve profit margins for products with comparatively inelastic demand but can undermine the competitiveness of exports if international prices for substitutes stay flat or lead imports to become more attractive. Besides, sales price increases in the presence of widespread indexation may propagate a wage-price spiral with the potential to do long-term harm to the economy, specifically for countries that are part of a currency union like Belgium. Finally, raising compensation across income brackets in lockstep with each other at periods of elevated inflation may limit the room for differentiating wages according to productivity developments in the public administration or at the level of industrial sectors and firms, thereby aggravating labor market rigidities. Against this background, the following analysis investigates inflation drivers, also from a cross-country perspective, which may inform the trajectory of future prices in Belgium once the present accumulation of shocks starts to dissipate. Then, it sketches an overview of the key features of Belgium's wage-formation framework before highlighting some of its weaknesses with the aim to suggest recommendations to better balance its benefits with its costs.

B. A Burst of Inflation Explained: Blaming the Usual Suspects?

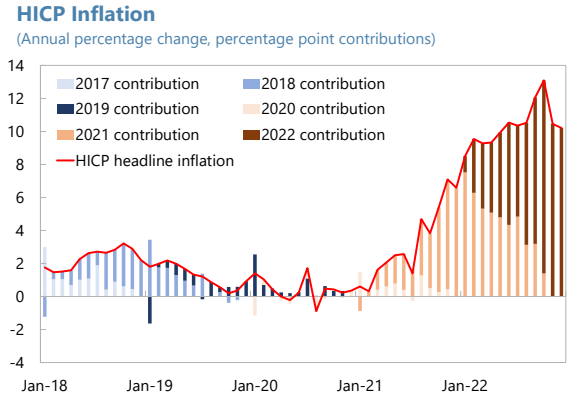
4. Current price pressures in Belgium show parallels to periods of elevated inflation in recent history yet also involve some important differences. Specifically, energy prices have again proven to be a key driver of inflation. Not unlike comparable episodes in 2008 and 2010-11, energy prices accounted for around a third of the 10.2 percent rise in Belgian headline inflation in December 2022, but their recent rate of increase far surpasses any antecedents of the 2000s. Likewise, processed food prices contributed 2.4 percentage points to headline inflation in December 2022, roughly the same share as in 2008 with an inflation rate that is about three-fifths higher than at the time. The prices of services and non-energy industrial goods have recently grown at rates not seen in the 2000s to date, adding a respective 1.8 and 1.9 percentage points to headline inflation in December 2022.

5. The specific mix of supply- and demand-side drivers acting on inflation in the moment is the result of a succession of shocks. As the economy re-opened after the pandemic, pent-up demand, particularly for services that could not be enjoyed with containment measures in place, met supply chain bottlenecks still related to the pandemic and a labor market that was quickly returning to the tightness witnessed ahead of the disruptions brought about by Covid-19. When some of these effects began to fade, a second shock hit the economy in the form of steeply rising energy and food prices—a consequence of Russia's war in Ukraine—with an ongoing lack of labor supply adding fuel to the fire.

Belgium: Contributors to HICP Headline Inflation



Sources: StatBel and IMF staff calculations.



Sources: StatBel and IMF staff calculations.

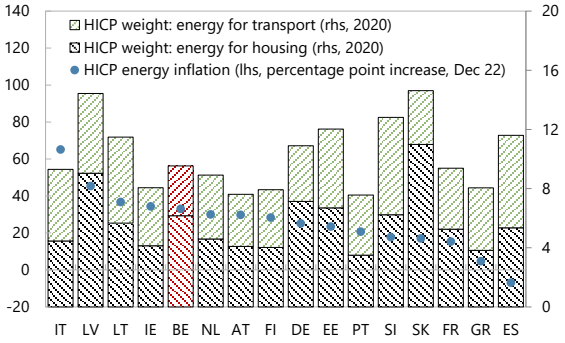
6. Energy price inflation in Belgium is among the highest in the euro area, in part driven by the relatively low taxation of energy products. By December 2022, energy prices increased at an annual rate of 33.0 percent, after peaking at a record 69.2 percent in October. Belgium's taxation of energy and natural gas is lower than the euro area average, ensuring a more potent pass-through from wholesale to retail markets. An in-depth examination by the OECD about the use of energy and environmental levies in its member countries indicates that Belgium maintains much more modest excise taxes on diesel and natural gas for the use in buildings than other countries in the European Union.[6] In addition, energy price pressures translate more easily into headline inflation in Belgium than in most other euro area countries, as the weight of energy products in the consumption basket constituting its HICP, particularly of expenses related to the heating and powering of homes, is rather high. Besides, Belgium's energy market is characterized by a comparatively high degree of liberalization without any price controls and variable rate contracts are generally adjusted at intervals that are shorter than in some other EU countries. Lastly, the methodological approach for measuring energy price inflation plays a role. Like statistical institutes elsewhere in the EU, Statbel determines energy inflation on the basis of newly concluded contracts, thereby not reflecting the prices experienced by consumers with existing fixed-price, longer-term arrangements. Especially in periods of rapidly rising energy prices, this method tends to overstate inflation reported by the HICP. For Belgium, however, the effect is likely to be less pronounced than in some other euro area countries as fixed-price contracts typically have a duration of only a year. As a result, most have expired by now and have been renewed at prevailing prices.[7]

[6] See OECD (2019).

[7] For a recent overview, see Jonckheere (2022).

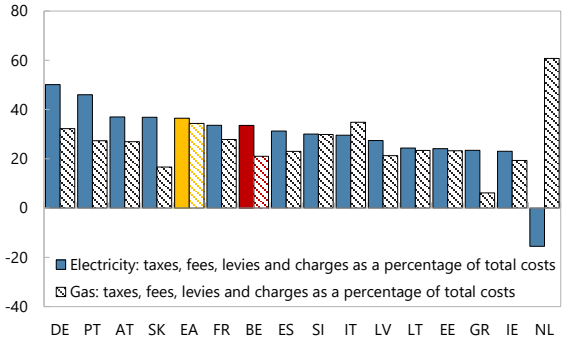
Belgium: Energy Weights in Consumer Price Baskets and Energy Taxation

Energy Inflation and Consumper Price Basket Weights
(Lhs: annual percentage changes, rhs: percentages)



Source: Eurostat.

Energy Taxation
(Percentages)



Source: Eurostat.

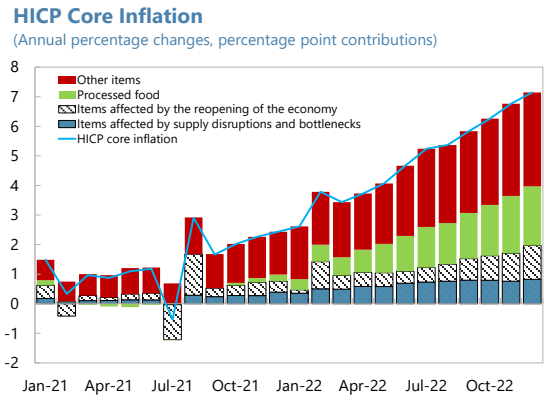
7. Pandemic- and Ukraine war-related price pressures have increasingly contributed to rising core inflation as corporations have been able to pass cost increases on to consumers. Since September 2021, the contribution to headline inflation of HICP consumption basket items affected by the re-opening of the economy (15.4 percent of items in 2022) as well as by supply disruptions and bottlenecks (13.9 percent of items in 2022) has climbed from 0.5 to 2.0 percentage points.[8] Similarly, the Ukraine war has amplified the contribution of processed food prices on core inflation from 0.6 percentage points in February to 2.0 percentage points in December, due to its impact on global markets for agricultural commodities. Besides, national accounts data are indicating that, at least on aggregate, the non-financial corporate (NFC) sector seems to have been rather well-placed to transmit higher costs to sales prices. NFC aggregate gross profit margins notably improved between Q4:2020 and Q2:2022, keeping them above levels seen in most other euro area countries and higher than before the pandemic.[9] Still, aggregate figures may conceal substantial heterogeneity across individual firms. Indeed, microeconomic evidence points towards a sizeable share of Belgian companies having experienced a decline in gross profit margins between 2021 and 2022, with the positive development in the aggregate primarily driven by trends in the profitability of a few large corporations.[10]

[8] The classification of HICP consumption basket items into goods and services affected by the re-opening of the economy and by supply disruptions and bottlenecks follows Cuquerella Ricarte et al. (2022).

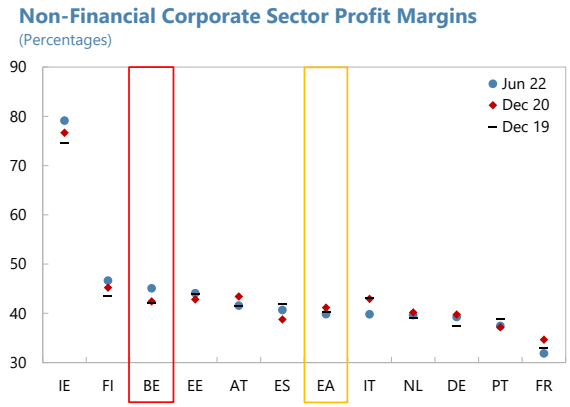
[9] The NFC profit margins shown in the chart were compiled on the basis of national accounts data, expressing the gross operating surplus of the NFC sector as a percentage of its gross value added. A simulation based on microdata by Bijnens and Duprez (2022) showed qualitatively similar results, indicating that energy price and wage pressures appear manageable for the Belgian corporate sector.

[10] See Bijnens and Duprez (2023).

Belgium: Contributors to HICP Core Inflation and Corporate Profit Margins



Sources: Eurostat and IMF staff calculations.

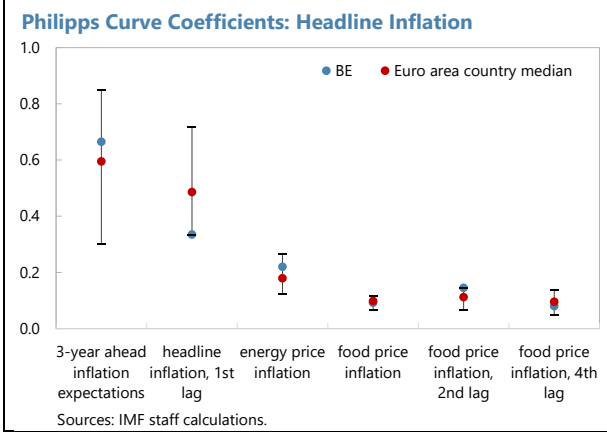


Sources: Eurostat and IMF staff calculations.

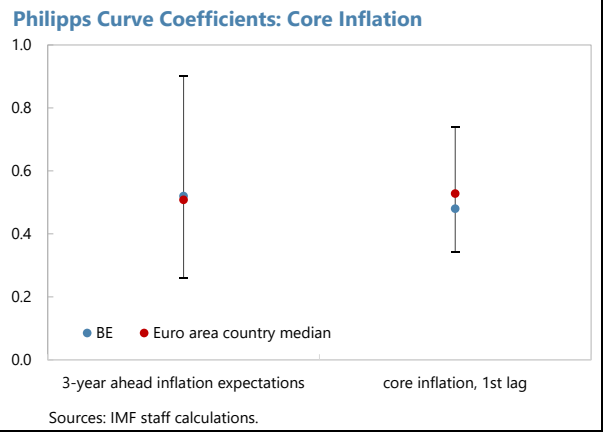
8. Compared to the median euro area country, Phillips curve estimates point towards some differences in the inflation-setting process and inflation persistence in Belgium.[11] In particular, Belgium is among a small group of euro area economies where food prices enter headline inflation at various lags, albeit with coefficients of relatively small magnitude. More commonly, energy prices are a statistically-significant driver of headline inflation but their impact is somewhat higher than in the median euro area economy. The persistence in headline inflation is the lowest among the euro area countries in the sample, while forward-looking inflation expectations play a somewhat more prominent part for the setting of headline inflation than in the median euro area economy. Estimation results for core inflation are qualitatively similar, yet Belgium's distinctiveness in comparison to the euro area median declines and the statistical significance of commodity prices vanishes.

[11] The coefficients in the charts are estimated separately for headline and core inflation on a country-by-country basis with the help of a standard New Keynesian Phillips curve augmented by variables proxying for price developments abroad (lagged by one quarter) as well as for global energy prices (contemporaneous) and food prices (contemporaneous and lagged by up to four quarters). The remaining variables entering the regression are a measure of domestic slack (contemporaneous unemployment gap derived as the deviation from the Hodrick-Prescott-filtered unemployment rate), headline/core inflation lagged by one quarter, three-year ahead Consensus Economics inflation expectations and a set of country fixed effects. For further details about the estimation methodology, see IMF (2022). The charts only present the variables that were statistically significant at a confidence level of at least 10 percent for the case of Belgium. Likewise, the euro area median as well as the range are only taking account of countries where the corresponding variable was statistically significant at a confidence level of at least 10 percent. Apart from Belgium, the euro area countries in the sample include Estonia, Finland, France, Germany, Greece, Ireland, Italy, Latvia, Lithuania, the Netherlands, Portugal, Slovakia, Slovenia and Spain.

Belgium: Phillips Curve Coefficients



Sources: IMF staff calculations.



Sources: IMF staff calculations.

C. Wage Formation in Belgium: Getting the Best of Both Worlds?

9. Wage formation in Belgium is characterized by the desire to shield households from purchasing-power losses while protecting the competitiveness of a highly-open economy. The wage-setting process was codified into law in 1996 by the "Law on the Promotion of Employment and Maintaining Competitiveness" (henceforth the Wage Law).[12] The Wage Law obliged social partners to negotiate salary increases over a two-year period within the bounds of an upper limit set by anticipated hourly wage developments in key export markets (France, Germany, the Netherlands) and a floor determined by expected inflation in Belgium.[13] At the same time, wages in Belgium are indexed to inflation by means of a so-called "health index"[14], opening the door for rises in compensation to exceed the maximum threshold stipulated by the Wage Law if actual inflation outcomes in Belgium surpass both expectations and wage growth in neighboring economies. While the Wage Law was broadly successful in keeping salary developments in line with the three comparator countries over the first decade of its existence[15], a 4 percent gap emerged by 2010, reflecting reluctance to fully enforce the provisions of the Wage Law, but also an episode of prolonged wage restraint in Germany, which contributed to an overestimation of the evolution of compensation in the three peer economies.[16] As a result, the federal government in Belgium made use of its prerogative granted by the Wage Law to set a comparatively moderate benchmark for wage rises for the 2011-12 and 2013-14 negotiation rounds, followed by suspension of indexation

[12] See "Loi relative à la promotion de l'emploi et à la sauvegarde préventive de la compétitivité" (http://www.ejustice.just.fgov.be/cgi_loi/change_lg.pl?language=fr&la=F&cn=1996072632&table_name=loi).

[13] The Wage Law also makes amends for wage drift to account for changes in pay due to, e.g., seniority, promotions or shifts in the employment structure.

[14] The "health index" removes alcoholic beverages, tobacco products and motor fuels (except LPG) from the CPI. Its smoothed version, a 4-month moving average, underpins the indexation of public sector wages, most private sector wages, pensions and social security benefits as well as some prices, such as rents, certain insurance premia or some doctors' fees.

[15] See IMF (2007).

[16] See CCE (2014) and CCE (2017).

between April 2015 to April 2016, which helped close the gap.[17] To minimize the need for such interventions, a wider reform of the Wage Law was implemented in 2017, making the determination of the maximally-permissible wage increase by the Conseil Centrale de l'Economie (CCE) a binding factor in salary negotiations. Moreover, the approach for deriving the ceiling was revised by introducing a correction term for past overshoots of wage developments between Belgium and its three neighbors as well as a safety margin to account for potential forecasting errors. In its current form, the Wage Law effectively puts an upper limit on the real wage rises the social partners can negotiate by considering expected gaps between nominal hourly wage developments in Belgium and abroad over the coming two years while also correcting for past deviations and incorporating a safety margin to address forecasting uncertainties.

10. Despite successfully maintaining wage competitiveness in recent years, the current run-up in inflation is prone to put the wage setting framework under additional strain. Against the background of manageable wage discrepancies with the three comparator economies, the reformed Wage Law allowed for two-year real wage improvements of 1.1 percent in 2017-18 and 0.8 percent in 2019-20, respectively.[18] However, for the period 2021-22, the available scope for real wage hikes was identified at 0.4 percent[19], drawing the ire of labor unions. Agreement could not be reached among the social partners, necessitating government mediation at non-negligible fiscal costs.[20] Since the end of 2020, the pace and degree of wage indexation has accelerated with rising inflationary pressures. Each cumulative 2 percent increase in the smoothed health index implies an equivalent, near-immediate rise in nearly half of private sector salaries and in public sector wages as well as in pension and social security outlays.[21] For the large remainder of private sector pay (close to two-fifths) indexation takes place in January of each subsequent year, which implied an approximately 10 percent rise at the start of 2023. Since wage developments in the three neighboring countries have not kept pace with Belgium to date, CCE estimates point to the opening of a wage gap of 2.9 percentage points by the end of 2022. This gap is anticipated to widen to 5.7 percent by the end of 2024.[22] In the spirit of the Wage Law, the extent of this overshoot suggested no space for real wage growth in 2022-24, requiring another costly round of intervention by the government to secure a deal between social partners.[23]

[17] The suspension of indexation was performed by a so-called "index jump". In April 2015, the smoothed health index was lowered by 2 percent from its March 2015 value and indexation only resumed once the index had caught up with its March 2015 level which was the case in April 2016.

[18] See CCE (2017) and CCE (2019).

[19] See CCE (2021).

[20] To preserve social peace, the government made concessions on early retirement provisions, exempting some overtime arrangements from tax and social security payments, and providing employers with some form of compensation for raising the minimum wage.

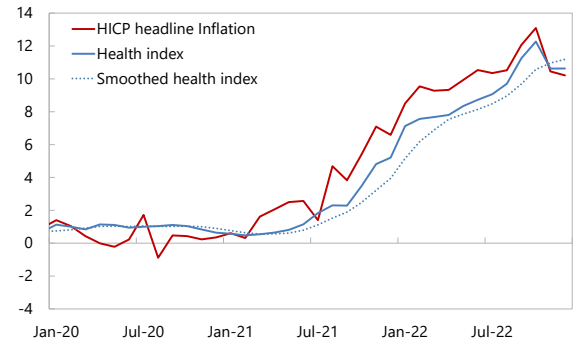
[21] Social benefits and public sector wages are indexed a respective one month and two months after a 2 percent increase in the smoothed health index.

[22] See CCE (2022).

[23] For firms that were (exceptionally) profitable in 2022 companies, the government proposed a €500 (€750) bonus payment for 2023 in the form of consumption vouchers that are fully tax-deductible for companies and tax-free for employees.

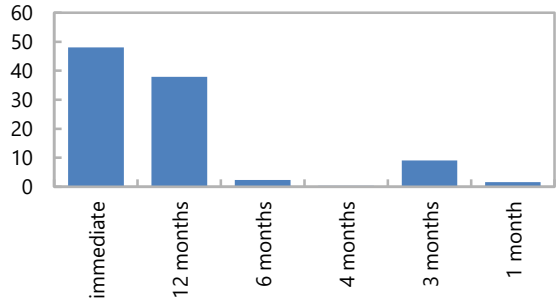
Belgium: Health Index Inflation and Mechanisms for Private Sector Wage Indexation

HICP Headline Inflation and CPI Health Index Inflation
(Annual percentage changes)



Sources: StatBel, Eurostat and IMF staff calculations.

Mechanisms for Private Sector Wage Indexation, 2021
(Percentages)



Source: NBB.
Note: The chart shows the share of employees benefitting from wages indexation immediately after a 2 percent health index increase or at n month intervals.

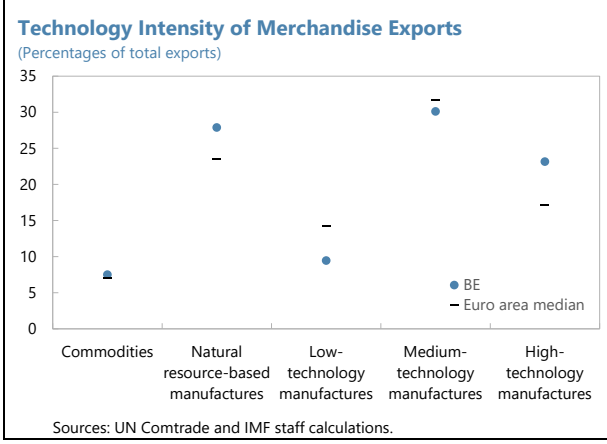
D. Systemic Weaknesses of Wage Formation and Policy Recommendations

11. To enjoy the benefits of indexation, maintaining a mechanism such as the Wage Law to align domestic with foreign wages is essential to preserve external competitiveness. Belgium can be characterized as a highly-integrated small open economy facing substantial competition in international markets. The technology-intensity of its merchandise exports is comparatively high with medium- and high-tech manufactures accounting for more than half of the total exports of goods, somewhat above the euro area median, suggesting at least some pricing power from a differentiated product mix with high value-added.[24] However, more standardized goods, such as commodities and natural resource-based manufactures are also prominent, with a 35 percent share. In addition, Belgium does not occupy a dominant supply position in its three main foreign markets for the vast majority of its manufactures, including for products that constitute the largest share of its exports, implying the existence of substitutes and the need to sustain price competitiveness.[25]

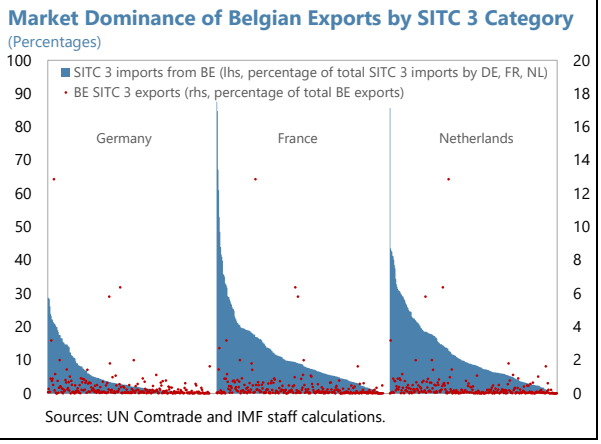
[24] The classification of merchandise exports into commodities, natural resource-based manufactures as well as low-, medium- and high-technology manufactures is based on the Standard International Trade Classification (SITC) and follows Lall (2000).

[25] Using the Standard International Trade Classification (SITC) at the third-highest level of detail, the chart shows Belgium's share in the total imports by France, Germany and the Netherlands of each of the 260 SITC level 3 product groups (blue bars) as well as the share of each of the 260 product groups in Belgium's exports (red dots).

Belgium: Export Structure and Export Market Shares



Sources: UN Comtrade and IMF staff calculations.

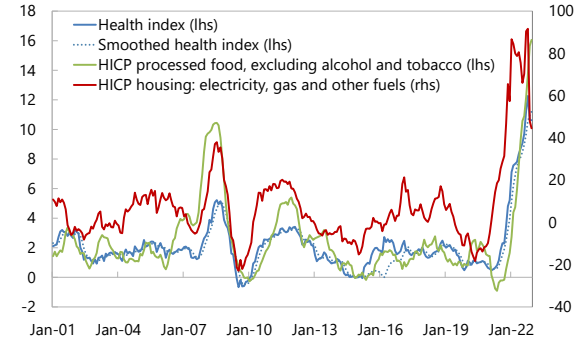


Sources: UN Comtrade and IMF staff calculations.

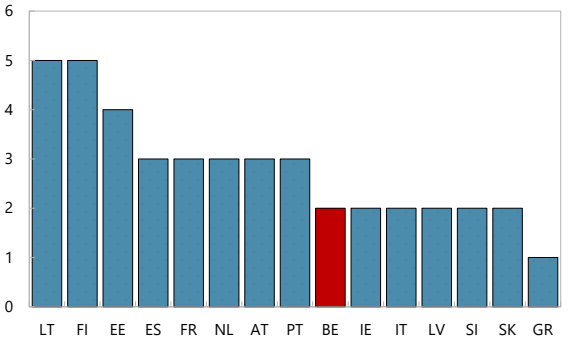
12. The present episode of record high inflation is putting some of the weaknesses of the wage indexation framework and its corrective arm, the Wage Law, into sharper relief. Most notably, global or idiosyncratic price shocks get rapidly transmitted to Belgian wages, as the smoothed health index is not well insulated from fluctuations in the most volatile components of the HICP, such as energy or food prices. Moreover, the provisions of the Wage Law mandate prolonged periods of low or no improvements of real compensation if salaries abroad do not fully catch up with near universal wage indexation in Belgium. As a consequence, the bargaining space for labor unions becomes unduly constrained while employers lose leeway to adjust real base pay for existing employees with productivity developments at the firm or sectoral level, further aggravating the rigidity of a labor market that is already characterized by relatively low job-to-job transition rates.[26] Finally, the tension between compensating workers for purchasing-power losses and maintaining external competitiveness fosters a confrontational stance between employees and employers at times of elevated inflation, weakening social cohesion. It also leads to frequent government intervention in collective bargaining, such as the freeze in indexation administered in 2015-16 or the brokering of a compromise in 2021 and 2022, at additional budgetary costs, likely a sub-optimal outcome for a process that should ultimately be driven by the private sector.

[26] However, Coppens and Saks (2022) show that, despite the rigid wage formation process, salaries in Belgium largely reflect productivity differences, at least at the sectoral level. At the same time, they also find evidence for more notable divergence at the firm level or between educational attainments.

Belgium: Health Index Inflation Drivers and Job-to-Job Transition Probabilities

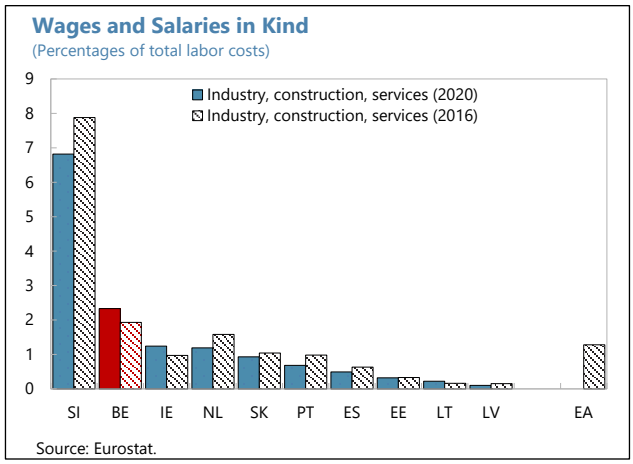


Sources: StatBel, Eurostat and IMF staff calculations.



Source: Eurostat.

13. Absent abolition of salary indexation and the Wage Law, several avenues of reform could improve the performance and viability of the current wage-setting framework. Possible measures may target the wage formation process itself, but could be usefully complemented by policy efforts in other areas. In particular:

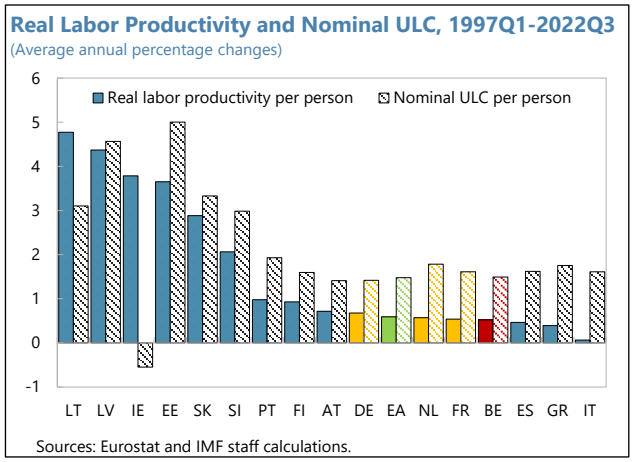


Source: Eurostat.

- **The basis for indexation, the smoothed health index, should be reviewed**. At present, shocks from highly volatile components of the consumer price basket, like energy or food prices, feed quickly into wages, shifting the burden of adjustment from households to other sectors of the economy. Therefore, the scope for excluding such items from the smoothed health index should be fully explored, as this would distribute losses more evenly, particularly in the event of a terms of trade shock. In addition, it would contribute to a more predictable development of salaries—and wage costs—over time, replacing the present alternation of episodes of briskly rising compensation with periods of prolonged moderation mandated by the provisions of the Wage Law. If a fuller compensation of households for purchasing power losses is desired, it could be achieved by well-targeted fiscal support for vulnerable groups, a strategy made easier by indexation already cushioning part of the impact of higher prices on household budgets, thereby obviating the need for much more broad-based measures. Likewise, loosening the rigidities imposed by the Wage Law by re-defining the health index may give more frequent opportunities to social partners to negotiate on (real) salary increases differentiated across sectors or firms. This may contribute to a more optimal allocation of economic resources and reduce the necessity to rely on second-best alternatives, such as government intervention in the wage bargaining process or

workers and their employers resorting to less transparent in-kind benefits to achieve a differentiated compensation structure.

- **Productivity trends should be accounted for to capture deviations of labor costs between Belgium and its key export markets in a more appropriate manner**. Although labor productivity and nominal unit labor costs per person in Belgium have largely developed in line with its three-country benchmark and the euro area average over the past 25 years, potential deviations should be taken into consideration. Such an approach would also have the advantage that improvements in productivity above comparator economies could be reflected in higher wages. Slower-than-comparator productivity gains could be reflected in lower wages, rather than by increasing capital intensity or moving production abroad. Furthermore, widening the group of countries against which salaries and productivity are assessed might be advisable. France, Germany and the Netherlands constitute less than half of Belgian merchandise exports, potentially hiding losses in external competitiveness against other important trading partners.



- **Options to at least temporarily widen the flexibility of the indexation regime should be contemplated**. While private sector wage indexation is guaranteed by the Wage Law, opening avenues for a well-considered relaxation of strict indexation rules in cases where the going concern of a viable firm is at risk should be reflected upon. In the recent past, parts of the corporate sector have been confronted with a multiplicity of shocks, ranging from the pandemic to supply chain disruptions and surging input costs, warranting the creation of opportunities for particularly affected companies to pause or limit wage indexation to preserve investment and employment.[27] In the long-term, possibilities for reviving contracts with all-in clauses should be assessed. Their compensation for expected rather than actual inflation could have benefits similar to the re-casting of the health index and would also fit the comparatively forward-looking inflation formation process suggested by Philipps curve estimates.

- **A stronger reliance on excise duties to tax energy products, specifically for housing-related purposes, should be considered**. In an international context, taxation of energy supplies for the heating and powering of buildings is low. In pondering the use of taxes to achieve ambitious emissions reduction and climate goals, preference should be given to excise rather than ad valorem taxes. By being charged on a per-unit basis, excises would dampen the

[27] Some sectors, such as banks and insurances, are indeed capping wage indexation at a maximum threshold at times of high inflation.

pass-through of energy price fluctuations from wholesale to retail markets and on to consumer price inflation and wages.

- **Product market reform should be accelerated.** Across euro area countries, the profit margins of Belgian corporations appear elevated, possibly pointing towards some lack of competitive pressures. Even though margins are anticipated to sharply contract in the coming quarters[28], they are likely to remain above the euro area average. Weakening the ability of firms to transmit higher input costs to sales prices by encouraging competition via product market reforms would contribute to containing the risks of a wage-price spiral while also fostering a more dynamic economy.

[28] See again CCE (2022).

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FISCAL FEDERALISM IN BELGIUM: CHALLENGES IN RESTORING FISCAL SUSTAINABILITY[1]

Fiscal decentralization in Belgium progressed substantially in 2015-19. However, as decentralization of expenditure responsibilities continued to outpace decentralization of revenue authority, vertical fiscal gaps and greater reliance on transfers from shared resources may have reduced spending discipline. Consecutive shocks (pandemic, energy prices) have worsened the fiscal positions of all levels of government, requiring urgent and concerted effort to improve fiscal and debt sustainability. Fostering better fiscal policy coordination across all levels of government would improve the efficiency of Belgium's decentralized fiscal framework. We recommend that fiscal adjustment at the subnational levels should be a part of the general government fiscal consolidation plan, with strict spending limits applying; integrating systematic spending reviews in the budgetary process; and adopting a more strategic, multi-annual fiscal framework to support adjustment. Implementing the 2013 Cooperation Arrangement—intended to provide fiscal rules to govern and coordinate public finances at all levels—is important. Also, the cost of overborrowing at the regional level should be fully internalized; recalibration of transfers could be considered; and some flexibility should be retained in the pace and scope of further decentralization. Finally, there is scope to improve the integration of fiscal sustainability objectives in federal and subnational structural reforms.

A. Introduction

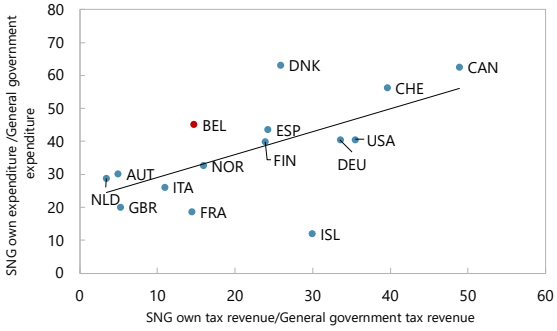
1. Belgium is one of the most fiscally-decentralized advanced economies. Fiscal decentralization—the devolution of revenue collection and expenditure execution responsibilities from the federal to the subnational authorities—has progressed in stages under six state reforms implemented over five decades (Box 1). However, as expenditure decentralization outpaced revenue decentralization, the vertical financing gap is high in Belgium, compared with most other peer economies. Belgium has the most decentralized spending autonomy among euro area economies and ranks fourth globally among advanced economies after Canada, Switzerland, and the U.K. Subnational governments in Belgium are responsible for 46 percent of total spending, while own tax revenues are equivalent to 16 percent of total tax revenues. With the combined effect of strong revenue centralization and decentralization of spending to subnational governments, Belgium's vertical fiscal imbalance—the share of sub-national own spending not financed through own revenues—was high at 50 percent in 2019.[2,3]

[1] Prepared by Yu Ching Wong (EUR), with valuable comments by Mark Horton, participants at a National Bank of Belgium seminar, and other NBB and government officials.

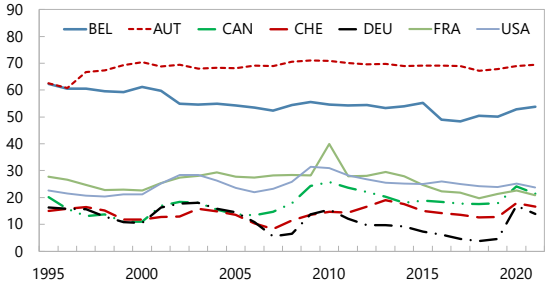
[2] Subnational government comprises state and local governments in the OECD Fiscal Decentralization database. This corresponds to regional and community governments and local provincial and municipal authorities, respectively, in Belgium.

[3] See ¶6 and ¶11 for a discussion of vertical fiscal imbalance estimates.

Belgium: Highly Decentralized in Spending with High Vertical Fiscal Imbalances



Sources: OECD and IMF staff calcuations.



Sources: OECD and IMF staff calculations.
1/ Subnational (SNG) is sum of state and local governments; except France and the U.S. are state only. Vertical fiscal imbalance= 1 - [(SNG own revenue)/(SNG own spending)]

2. Fiscal decentralization has strengths and weaknesses. One of the key merits of decentralization of public spending is that it may improve effectiveness of delivery of public services (planning, execution, accountability) that are more tailored to local needs. Shifting spending decisions and execution from the federal government has been attractive in Belgium, in light of considerable economic and social heterogeneity among its three regions—Flanders, Wallonia, and Brussels-Capital and three communities (Flemish-, French-, and German-speaking). By contrast, fiscal decentralization may pose challenges for fiscal discipline. Subnational government may have little incentive to save shared revenues ("common pool" problem), particularly if arrangements or past central government support created moral hazard, if strong heterogeneity of subnational jurisdictions is not adequately addressed in the design of intergovernmental fiscal relations and transfers, or if there are privileges (or disadvantages) from constitutionally-established arrangements and autonomy among the subnational governments (Ter-Minassian (2007)). Many of these factors are present in Belgium.

3. A high reliance on grant-based transfers poses continuing challenges for fiscal discipline in Belgium. The predominance of grant-based transfers in the financing of subnational governments in Belgium, rather than a more balanced mix of expenditure and tax autonomy, affects incentives, budgetary processes, and the direction of resource distribution between the federal and subnational governments. Past studies (e.g., Jennes (2014)) have highlighted that fiscal federalism arrangements in Belgium, which rely heavily on grant transfers from the federal government and the social security system, may result in a soft-budget constraint, with scope for rapid spending increases at the regional and community levels and with fewer incentives to rationalize expenditures in the absence of binding budgetary targets. By contrast, local authorities, which have very limited own revenues, have a good track record in keeping their budgets balanced due to the requirement to adhere to a strict budgetary framework. Grant transfers also appear to be not fully compensated by revenue mobilization or expenditure restraint at the levels of the government that provide the transfers. These features of regional finances appear to have affected fiscal discipline and contributed to fiscal imbalances at the general government level. Heterogeneity among the regions has added complexity in managing public finances, as there is political support in Flanders to seek

greater autonomy, while in the two other regions, there is strong interest in maintaining solidarity and distribution among regions and communities, supported by interregional transfers (Gerard (2015)).[4]

4. The recent series of shocks—the Covid-19 pandemic and spillovers from Russia's war in Ukraine—have significantly affected Belgium's fiscal position. The combined effect of structural spending increases in response to the crises and increasing costs from population aging and social benefits over the medium term, are weighing on public finances at all levels of government. The need to strengthen policy efforts to improve public debt sustainability and restore fiscal space to safeguard the economy from the impact of future shocks is clear. Significant fiscal adjustment is needed, and this effort will be more difficult if federal and regional/subnational policies are not well aligned and pulling in the same direction.

5. This paper reviews the key challenges of fiscal federalism and decentralization in Belgium in the context of strengthening the fiscal framework and ensuring fiscal and debt sustainability. It focuses on two main questions. First, how have the multi-level governance framework and fiscal decentralization evolved and impacted fiscal performance in recent years? Second, to the extent that fiscal decentralization contributes to persistent deficits and rising public debt, what are ways to improve the fiscal framework and budgetary processes to support medium-term fiscal consolidation and robust policies? Recognizing the substantial breadth and depth of the past literature on fiscal federalism in general and its relevance to Belgium in particular, this paper focuses on a narrower aspect: the role of fiscal decentralization in supporting consolidation and ensuring debt sustainability.

B. How Has Fiscal Decentralization Evolved in Belgium?

6. The decentralization of expenditure responsibilities in Belgium has outpaced devolution of revenue authority. The most recent push of decentralization took place during 2015-19, following implementation of Belgium's sixth state reform in 2014. The spending share of subnational and regional and community (excluding municipalities) governments increased from 38 percent and 25 percent, respectively, to 46 percent and 33 percent of general government total expenditure in 2019. On the revenue side, subnational and regional and community government (again, excluding municipalities) own tax collections also increased, from 10 percent and 5 percent in 2014 to 16 percent and 11 percent of general government tax revenue, respectively.[5] By 2019, subnational government own spending increased to 24 percent of GDP against their own revenue of 12 percent of GDP, closing the vertical financing gap by 5 percentage points between 2015 and

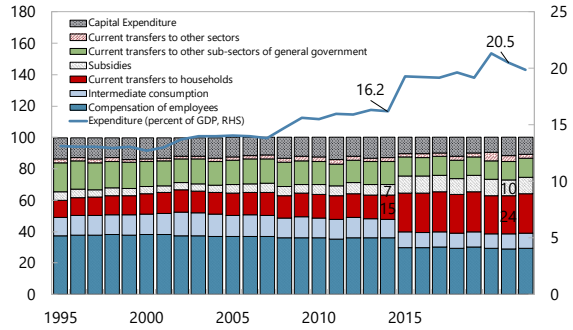
[4] Community governments are linked to languages and include the Flemish, French, and German communities. They are responsible for specific expenditure functions, importantly, in education. The Flemish community government is aligned with the Flemish regional government, whereas the French and German community governments are not as integrated with the respective regional governments (Wallonia and Brussels-Capital and Wallonia, respectively).

[5] "Regions have autonomy over taxation and enjoy exclusive competence (rate, basis, and exemptions) over most regional taxes. About 36 percent of their total resources come from own revenues. By contrast, communities have very low revenue autonomy and no fiscal autonomy." (European Committee of the Regions (CoR) -Division of Powers)

2019, but remaining elevated at 50 percent (Figure 1). As discussed below, most of the gap was covered by federal revenue and grant transfers, with some subnational borrowing.

Belgium: Transfer to Households and subsidies have increased

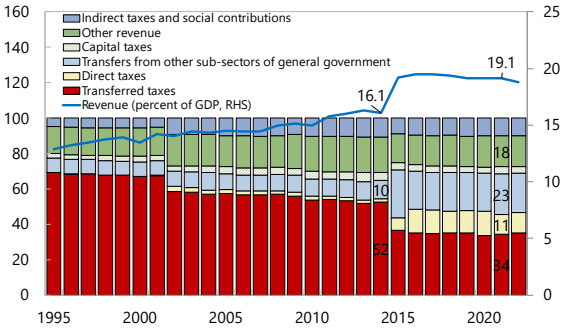
Expenditure of Regions and Communities
(Percent of total, unless noted otherwise)1/



Source: NBB.
1/ Figures for 2022 are estimates.

Belgium: Grant Transfers have Doubled While Taxes Collected Directly have Increased with a Reduction in Transferred Taxes

Revenue of Regions and Communities
(Percent fo total, unless noted otherwise)1/

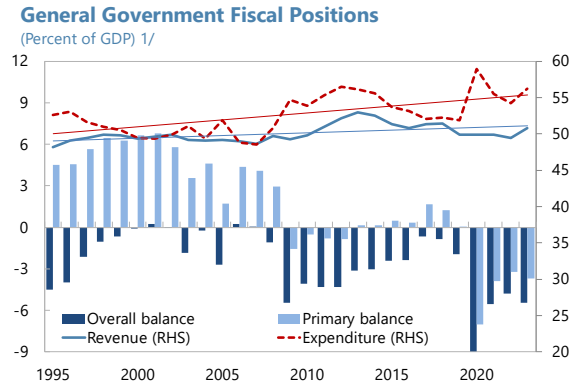


Source: NBB.
1/ Figures for 2022 are estimates

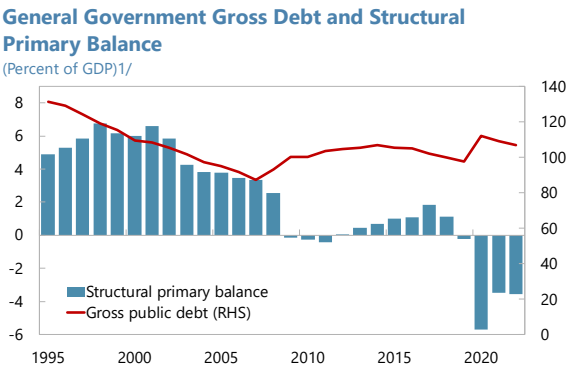
C. Key Challenges in Federal and Subnational Public Finances in Belgium

7. Recent changes in Belgium's fiscal-federalism set-up, starting from 2011, have coincided with a series of shocks that have worsened the fiscal outcome. The deterioration of fiscal balances and rising gross public debt from the global financial crisis started to be reversed around 2012 with economic recovery and fiscal consolidation. The improvement in fiscal sustainability was, however, first affected by large, discretionary spending measures in 2020 to mitigate the impact of the pandemic. The overall fiscal deficit widened sharply to 9 percent of GDP before narrowing to 5.6 percent of GDP in 2021. The fiscal position was expected to improve further from 2022 as most Covid-19 support measures were phased out, but instead is projected to remain elevated at 5½ percent of GDP in 2023 due to subsequent fiscal measures for the energy crisis and spillovers from the war in Ukraine. Without policy action, fiscal deficits will remain elevated over the medium term, as the expiration of these temporary measures will be met with aging related and interest payment cost increases. Consolidated public debt to GDP ratio is expected to decline to 107 percent in 2022 (due largely to denominator effect from high GDP deflator) from a recent peak of 112 percent in 2020, but is projected to rise to 120 percent in the medium term under unchanged policies. Historically, Belgium's high public debt level has fluctuated between 75 percent (1980) and 140 percent of GDP (1995).

Belgium: The Pandemic and Energy Crisis Have Worsened the General Government's Fiscal Position

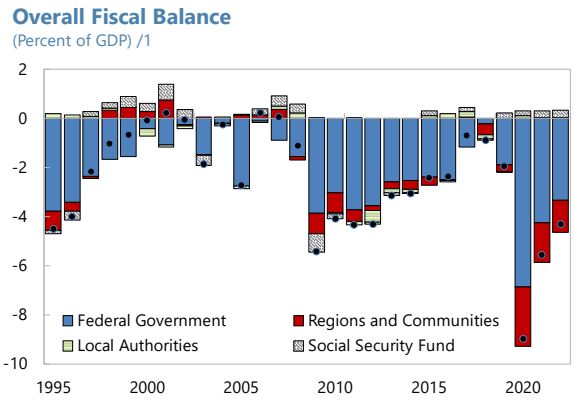


Sources: NBB and IMF staff calculations.
1/ Figures for 2022 and 2023 are estimates.



Sources: NBB and IMF staff calculations.
1/ 2022: proj.

8. With successive shocks in recent years, fiscal positions at the regions and communities' level have deteriorated. For the first time, overall combined deficits of regions and communities became significant, reaching 2.4 percent and 1.6 percent of GDP in 2020 and 2021, respectively, accounting for about 30 percent of general government deficits. Recent estimates by the National Bank of Belgium (NBB) suggest that region and community deficits narrowed to 1.3 percent of GDP in 2022 and will remain around this level in 2023-25 (Figure 2).

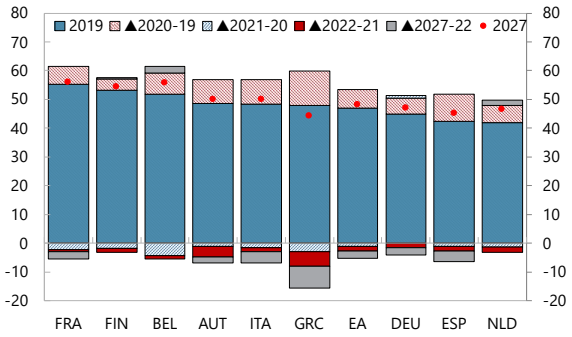


Source: NBB.
1/ Figures for 2022 are estimates.

9. Large public expenditures create challenges for fiscal sustainability. Belgium's public expenditures—at over 50 percent of GDP—were the third highest among euro area countries in 2019. The sizable increase of discretionary spending in 2020-21 during the pandemic was followed by less-than-full withdrawal in 2022. With unchanged policies, Belgium's public expenditures would rank highest in percent of GDP in the euro area by 2027. Four major functions— general public services, economic affairs, education, and health—account for half of general government spending, and Belgium's spending in these four areas is higher than in neighboring countries, by 0.3-2.1 percentage points of GDP in 2020. Spending on social protection accounts for close to 40 percent of general government expenditures, of which old age and sickness and disability outlays account for one half. A rapid increase of public expenditure took place during 2019-20, largely in healthcare and social protection. This was undertaken by the federal government and federal social security funds, with implications for the design and execution of fiscal consolidation.

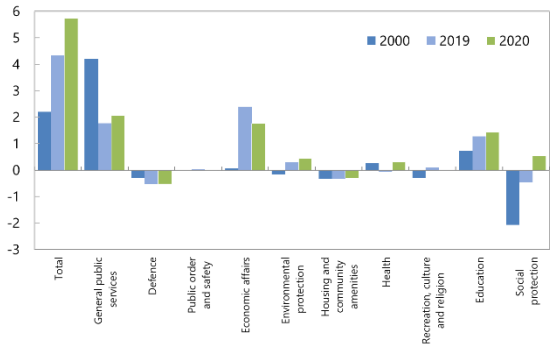
Belgium: The Third Highest Public Expenditure to GDP in Euro Area, Spending 6 Ppt of GDP More than Neighboring Peers

Public Expenditure
(In percent of GDP, projections for 2023-27)



Source: IMF World Economic Outlook, October 2022.

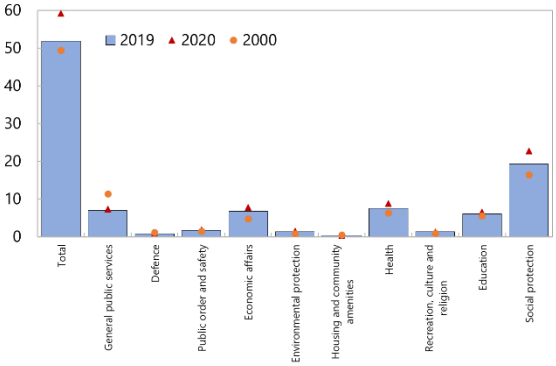
General Government Expenditure by Function (COFOG)
Deviation from the simple average of France, Germany, and the Netherlands
(Percentage points of GDP)



Sources: European Commission and IMF staff calculations.

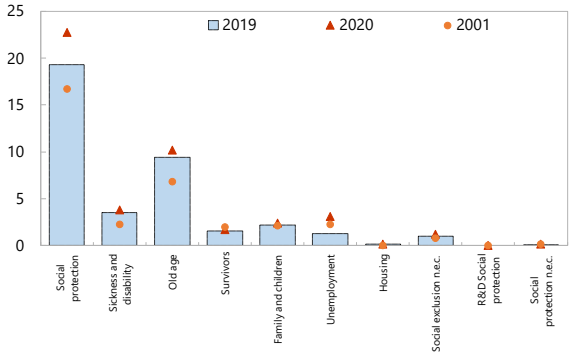
Belgium: Social Benefits Account for the Bulk of the Spending in General Government

General Government Expenditure by Function (COFOG)
(Percent of GDP)



Sources: European Commission and IMF staff calculations.

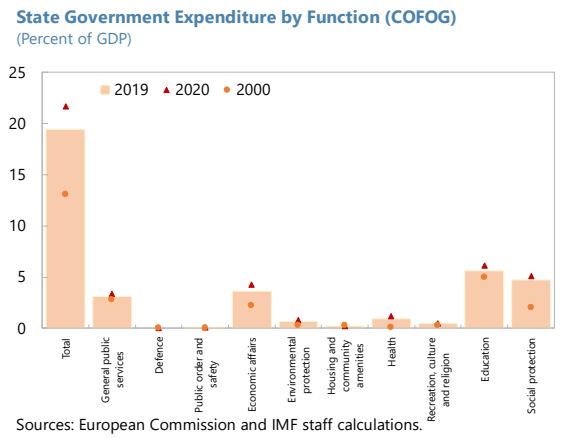
General Government Expenditure : Social Protection
(Percent of GDP)



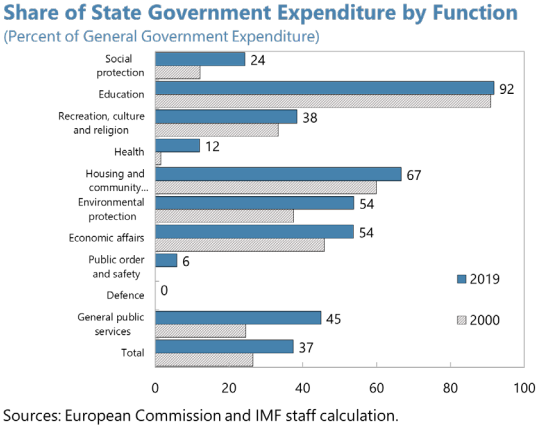
Sources: EC and IMF staff calculations.

10. With changes in spending decentralization, functional expenditure categories that are mainly executed by the state governments have increased. In addition to education (community competency), state governments managed more than half of total spending on housing, environmental protection, and economic affairs in 2019.

Belgium: Expenditure Functions Mainly Executed by the State Governments have Increased

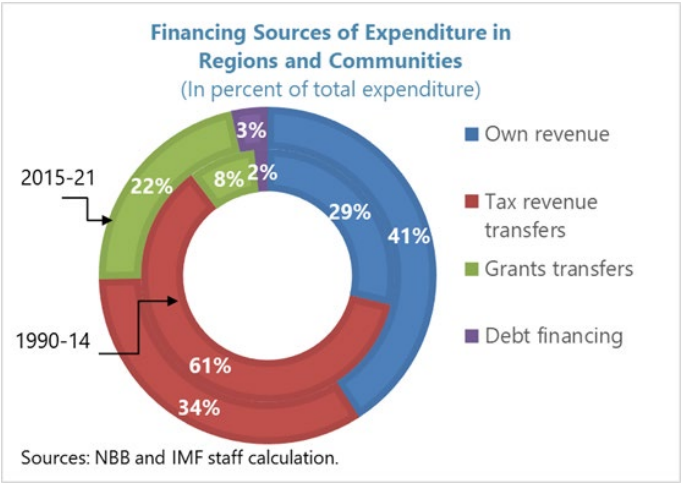


Sources: European Commission and IMF staff calculations.



Sources: European Commission and IMF staff calculation.

11. The large vertical fiscal imbalances are financed by inter-governmental transfers, adding complexity to regional equalization and the overall fiscal burden. Vertical fiscal imbalance (VFI) at the subnational government measures the extent to which subnational government expenditures are not financed through their own revenues, but financed by net transfers from other units of the general government (i.e., the federal government and federal-level social security funds) or by subnational government borrowing, all expressed as shares of subnational own spending. Transfers include tax revenue transfers and grants (i.e., current and capital transfers from other public authorities). Revenue devolution on its own would lower VFI, while spending decentralization would raise it. In fact, the reliance on 'current and capital transfers from other public authorities' (i.e., grant transfers) has increased. Grants transfers increased to 4.4 percent of GDP in 2015-21 from 1-1.7 percent of GDP during 1990-2014. While own revenues collected by region and community governments have increased with correspondingly lower transfers of tax revenues, the combined financing from tax revenue rose from 13 percent of GDP in 1990-2014 to 15 percent in 2015-21. Overall, grant transfers are formula-based with limited flexibility for *ad hoc* determinations or adjustments. As the leeway for subnational governments to increase their own revenues is relatively limited (although the regional governments could possibly utilize surcharges), additional support to subnationals—especially in the aftermath of a large negative shock—may increasingly rest on the federal government. Below are some specific features of financing sources of expenditures of regions and communities.



Sources: NBB and IMF staff calculation.

- Own revenues of the regions include some twelve own-sourced taxes, such as registration duties on sales of real estate, tax on vehicles, and taxes on goods and services.

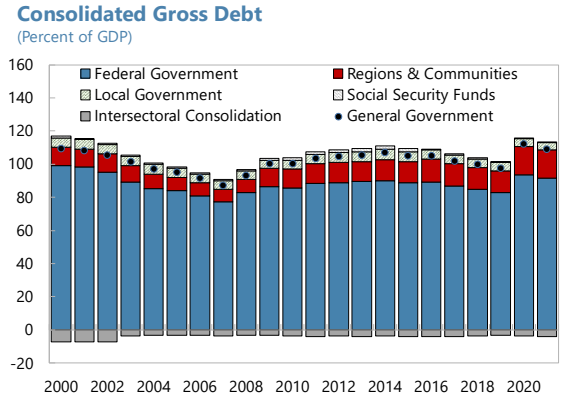
- Tax revenue transfers are shared taxes, as the regions receive a portion of personal income tax (PIT) revenues collected on their territory. Since 2014, the regions may also levy an additional regional tax on federal PIT.

- In contrast, communities do not have their own taxes, and are mainly financed by shared tax revenues from the PIT collected in their area and the VAT tax. Under an equalization mechanism, interregional revenue transfers take place via the federal government to regions whose average PIT yield is below the national average. Studies such as Gerard (2014) show that the Brussels and Walloon regions receive transfers with income per capita lower than the national average, while the Flemish region contributes.

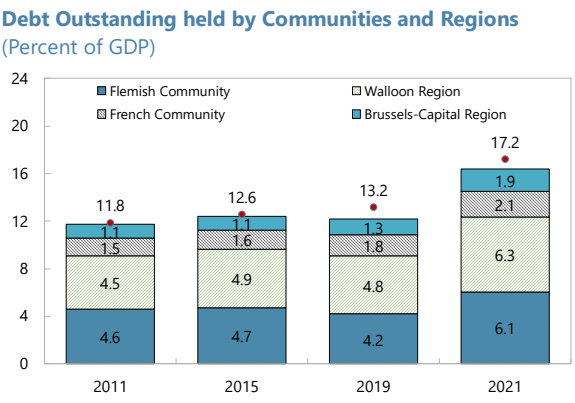
- The regions and communities receive specific federal grants to implement spending policies corresponding to their respective powers. Similar to tax revenue, the grants give rise to an interregional transfer only if the per capita amount of the region's grants differs from the national average of per capita grants.

- Estimates of fiscal resources redistributed through revenues and grants of the federal government and social security funds (NBB (2021)) show that Flanders made a net implicit contribution to interregional transfers of €6.2 billion (€900 in per resident). Brussels was also a net contributor of €900 million (€800 per capita), while Wallonia, received €7.1 billion (€1,900 per capita) in 2019.[6]

Belgium: Increasing Contribution of Communities and Regions Debt to 16 Percent of Consolidated Gross Debt



Sources: NBB and IMF staff calculations.



Sources: NBB andMF staff calculations.

12. The rapid increase in general government debt in 2020-21 included large increases in debts incurred by regional and community governments. Debts of regional and community governments, aggravated by the widening of deficits during the pandemic, increased from an average of 12 percent of Belgium's GDP in 2010-2015 to 17 percent of GDP in 2021. Debt

[6] For implicit transfers among regions, Flanders has been a net contributing region since the 1960s, whereas Wallonia has been a net beneficiary region (Gerard (2014)).

outstanding increased by 1.9 ppt of GDP in the Flemish region, 1.4 ppt of GDP in the Walloon region, and 0.6 ppt of GDP in the Brussels-Capital region over 2019-21. The dependency on debt financing to cover expenditures has increased rapidly—to about 22 percent for the Brussels Capital region and to 17 percent for the Walloon region, compared with less than 5 percent for the Flemish region in 2021 (Table 1). This steep buildup of the debt burden, together with the expected deterioration of regional fiscal positions over the medium term with unchanged polices and rising deterioration of regional fiscal positions over the medium term with unchanged polices and rising interest rates, are likely to have large, long-term impacts on the sustainability of regional finances.[7]

Table 1. Belgium: Financing Sources of Expenditure in Flanders, Wallonia, Brussels, and the French Community

	2011	2015	2019	2020	2021	2011	2015	2019	2020	2021
	Percent of GDP					Percent of total expenditure				
Flemish Region and Community										
Total revenue	9.2	11.1	11.2	11.2	11.2	99.6	98.9	100.2	89.6	95.1
Own revenue	3.4	4.1	5.1	5.2	5.0	36.3	36.6	45.2	41.6	42.0
Tax revenue transfers from other public authorities	5.0	3.9	3.8	3.6	3.7	54.1	35.1	33.6	28.9	31.5
Current and capital transfers from other public authoritie:	0.9	3.1	2.4	2.4	2.6	9.3	27.2	21.5	19.1	21.7
Debt financing (=Overall deficit)	0.0	0.1	0.0	1.3	0.6	0.4	1.1	-0.2	10.4	4.9
Total expenditure	9.2	11.2	11.2	12.5	11.8	100.0	100.0	100.0	100.0	100.0
Transfers to other public authorities and other sectors	1.5	1.6	1.5	2.1	1.7	16.6	14.0	13.5	16.7	14.6
Expenditure (excl. transfers)	7.7	9.7	9.7	10.4	10.1	83.4	86.0	86.5	83.3	85.4
Walloon Region										
Total revenue	2.1	3.2	3.1	3.1	3.1	90.5	96.1	96.6	86.8	83.0
Own revenue	1.0	1.3	1.6	1.7	1.6	41.4	38.8	50.4	47.4	41.4
Tax revenue transfers from other public authorities	1.0	0.7	0.6	0.6	0.6	41.3	19.8	18.0	15.7	15.1
Current and capital transfers from other public authoritie:	0.2	1.2	0.9	0.8	1.0	7.8	37.6	28.2	23.7	26.5
Debt financing (=Overall deficit)	0.2	0.1	0.1	0.5	0.6	9.5	3.9	3.4	13.2	17.0
Total expenditure	2.3	3.3	3.2	3.6	3.7	100.0	100.0	100.0	100.0	100.0
Transfers to other public authorities and other sectors	0.6	0.7	0.6	0.8	0.8	26.8	21.0	19.7	23.4	21.5
Expenditure (excl. transfers)	1.7	2.6	2.6	2.7	2.9	73.2	79.0	80.3	76.6	78.5
Brussels Capital Region										
Total revenue	0.8	1.1	1.0	1.1	1.1	88.9	103.0	87.6	79.2	79.4
Own revenue	0.5	0.6	0.7	0.7	0.7	50.8	56.3	56.0	52.9	49.2
Tax revenue transfers from other public authorities	0.3	0.3	0.2	0.2	0.2	28.0	25.2	19.5	16.7	16.8
Current and capital transfers from other public authoritie:	0.1	0.2	0.1	0.1	0.2	10.0	21.5	12.1	9.5	13.4
Debt financing (=Overall deficit)	0.1	0.0	0.1	0.3	0.3	11.1	-3.0	12.4	20.8	20.6
Total expenditure	0.9	1.1	1.2	1.3	1.3	100.0	100.0	100.0	100.0	100.0
Transfers to other public authorities and other sectors	0.3	0.3	0.3	0.4	0.4	27.0	27.1	25.2	32.3	31.6
Expenditure (excl. transfers)	0.7	0.8	0.9	0.9	0.9	73.0	72.9	74.8	67.7	68.4
French Community										
Total revenue	3.4	3.6	4.3	4.2	4.2	94.6	98.6	99.0	98.3	92.7
Own revenue	0.8	0.8	0.8	0.8	0.8	21.0	22.5	17.6	17.6	17.4
Tax revenue transfers from other public authorities	2.1	2.2	2.1	2.1	2.0	59.4	60.6	49.0	48.4	43.6
Current and capital transfers from other public authoritie:	0.5	0.6	1.4	1.4	1.4	14.1	15.5	32.4	32.3	31.7
Debt financing (=Overall deficit)	0.2	0.1	0.0	0.1	0.3	5.4	1.4	1.0	1.7	7.3
Total expenditure	3.6	3.7	4.3	4.3	4.5	100.0	100.0	100.0	100.0	100.0
Transfers to other public authorities and other sectors	0.7	0.7	1.5	1.4	1.5	20.9	19.3	33.7	33.5	32.9
Expenditure (excl. transfers)	2.8	3.0	2.9	2.8	3.0	79.1	80.7	66.3	66.5	67.1

Sources: NBB and IMF staff calculations.

[7] In December 2021, Moody's downgraded the long-term debt rating of the Walloon region by one notch to A3, reflecting the long-lasting impacts of the Covid-19 crisis, the expectation that substantial deficits will elevate the region's debt for an extended period, and a less favorable assessment of the Walloon regional economy compared with Belgian and European peers.

In particular, relying on market-based risk assessment to influence regional debt issuance and debt sustainability may not be effective, especially if the federal authorities are perceived as responsible for supporting subnational borrowers.[8]

13. The outlook for regional public finances is challenging. The economic performance of the regions has been affected by initial conditions and by the pandemic, the energy crisis, and other shocks. The economy of Flanders recovered relatively quickly from Covid-19, surpassing its pre-pandemic GDP level in 2021. The Walloon economy has also recovered to pre-Covid-19 levels, but experienced devastating flooding in 2021; Wallonia also faces structurally higher unemployment. The post-pandemic catch-up has been slower in the Brussels-Capital Region, where activity was expected to reach its pre-Covid-19 levels in 2022 (FPB July 2022). The regions and communities are relatively well protected against the effects of inflation, due to the indexing of federal grants, but still faced additional costs for responses to the recent shocks. Looking forward, their fiscal deficits are expected to remain higher than before the pandemic.[9] Local authorities, however, are expected to continue to be in balance or record small deficits—in line with balanced budget requirements—while relying on revenue transfers from regional governments (Table 2).

Table 2. Belgium: Summary of Fiscal Positions: Net Lending (+)/Borrowing (-)
(Percent of GDP)

	2019	2020	2021	2022[1/]	2023[1/]
General government	**-1.9**	**-9.0**	**-5.6**	**-5.2**	**-5.8**
Entity I	-1.6	-6.7	-4.0	-3.4	-4.1
Federal government	-1.9	-6.9	-4.2	-3.0	-4.1
Social Secutiry Funds	0.2	0.2	0.3	-0.4	0.0
Entity II	-0.3	-2.3	-1.6	-1.8	-1.6
Regions and Communities	-0.3	-2.4	-1.6	-1.7	-1.4
Local government	0.0	0.1	0.0	-0.1	-0.2

Sources: FOD BOSA; and NBB.
[1/] 2022 and 2023 are based on 2023 Draft Budgetary Plan.

[8] Past episodes of implicit federal bailouts include amendments of the Special Finance Act in 1993 and 2001 to increase federal grants to the communities after the French community repeatedly ran large deficits; in 2003, the Brussels region received unconditional grants from the federal government to balance its budget (Schnabel (2019)). Credit rating agencies appear to assume (e.g., Moody's 2021 credit opinion on the Walloon Region) a high likelihood of extraordinary support from the federal government reflecting considerations such as Article 54 of the Special Financial Act, which allows regions and communities to offset insufficient or delays in payments by contracting loans guaranteed by the federal government.

[9] The overall deficit of the Walloon Region is expected to decrease to -0.45 percent of GDP (€2.58 billion) in 2023 and -0.35 percent of GDP in 2025, while the deficit of the Brussels-Capital Region is expected to be broadly unchanged from 2023 (-0.2% of GDP) to 2027 (-0.3 % of GDP). The French Community is expected to see the overall deficits increase to -0.2 percent of GDP (€1.1 billion) in 2023 and to -0.3 percent of GDP in 2025. The Flanders budget is expected to reach a balance by 2027, although interest costs are expected to triple by 2027 to €1.2 billion (0.2% of GDP) (FPB July 2022, HCF and NBB December 2022; all figures are in percent of national GDP).

D. Policy Options to Improve Debt Sustainability Under Fiscal Decentralization

14. Urgent and concerted effort is needed to reduce fiscal deficits and place debt on a firmly downward trajectory. Belgium's public debt sustainability risks will remain elevated given the high and rising level of outstanding debt, high continuing primary deficits, higher interest cost from rising interest rates over the medium term, aging costs, and other expenditure requirements, such as the green transition and energy and national security. An ambitious, sustained adjustment is needed.[10] To place debt on a downward path, staff recommends adjustment of at least 0.6 percent of GDP to restrain the rise of overall deficit in 2023 and of 0.8 percent of GDP or more annually during 2024-30 to reach structural balance (see Belgium 2022 Article IV Consultation Staff Report) The size and duration of the proposed adjustment are demanding and will require a comprehensive approach involving both the federal and subnational governments. Non-essential expenditures should be reduced, and new spending accommodated in a reduced envelope.

15. To support fiscal adjustment, several policy actions related to the fiscal federalism framework should be considered:

- ***Recommendation 1:*** **Fiscal adjustment at the subnational levels should be a part of an overall general-government consolidation plan, with strict spending limits applying.** With the devolution of spending responsibilities from the federal government, expenditures by the regional and community governments are currently equivalent to one-third of total general government spending. The burden of spending restraint therefore must be shared. Consideration could be given to a federal-regional/community split of 67-33 to share the burden of adjustment. This would imply annual reduction of spending of about 0.3 percent of GDP over the medium term at the level of the regions and communities under staff's proposed adjustment path. In addition, introducing expenditure rules for all levels of government would improve transparency and accountability for compliance with spending limits.

- ***Recommendation 2:*** **Integrate systematic spending reviews in the budgetary process.** Spending reviews currently taking place at the federal and subnational levels should be expanded and integrated systematically in budgeting and execution—recognizing that these are resource-intensive nature—with clear macroeconomic objectives, including reining in the rapid growth of public expenditure. The expansion spending reviews that are well integrated with the budgetary process would ensure that the reviews go in depth to help to identify and rationalize spending, delivering efficiency gains by focusing on results while reducing budgetary cost. The reviews should also help form a strategic and medium-term view to managing increasingly

[10] The authorities in 2021 envisaged an adjustment of 1.4 percent of GDP over 2021-24, but events were overtaken by spillovers from the war in Ukraine and energy price support to firms and households. Adjustment of 0.6 percent of GDP for 2023-24 was envisaged in the 2023 Draft Budgetary Plan. Adjustment plan have consisted of annual fixed (0.2 percent of GDP) and variable components, the latter calibrated to the level and growth of output.

scarce public resources. Undertaking these at the federal and regional levels would help identify gaps and synergies, within the current framework for competencies.

- ***Recommendation 3:*** **Adopt a more strategic, multi-annual approach to fiscal policy making to support adjustment and reforms.** While Belgium has medium-term budgetary procedures in place for the development of Stability Programs that all EU member states are obliged to submit annually (T+3), there is no multi-annual document that is produced alongside the Stability Program (EC 2015).[11] Multi-year budgetary trajectories prepared by the federal and subnational governments are often of a more indicative nature, with limited substantiation. Fully developing medium-term budgetary frameworks for all levels of government would be critical in facilitating a rules-based approach and raising accountability. It would also support "correction" of overspending in particular years (not "letting bygones be bygones"), such that the excessive deficits incurred in one year would be offset in the subsequent 2-3 years, helping incentivize savings to accumulate buffers or pay down debt.

- ***Recommendation 4:*** **Implement the 2013 Cooperation Arrangement to strengthen budgetary coordination between different levels of government.** Budgetary coordination provides safeguards against poor incentives and excessive deficits in one or more of the federated entities.[12] A Cooperation Agreement was established in Belgium in December 2013, aiming at ensuring budgetary coordination of all levels of government.[13] However, the Agreement has yet to be implemented in practice. While the regions and communities take note of the budgetary objectives and trajectories recommended by the High Council of Finance (HCF), there has limited political will for binding budgetary commitments at the intergovernmental level. Non-endorsement by the federal, regional, and community governments of budgetary targets proposed by has constrained the HCF from fulfilling its role in

[11] No formal medium-term expenditure or fiscal framework is in place. Each new government in Belgium must submit medium-term fiscal policy objectives (OECD 2019); the coalition agreement of the current federal government sets out medium-term strategic plans.

[12] Characterized as "institutionalized cooperation" between different tiers of government in Belgium via the High Court of Finance, the Coordination Committee and the Inter-Ministerial Conference on Finance and Budget (see Husson (2017)).

[13] The Cooperation Agreement on fiscal coordination was concluded between the federal government and the regional and community governments, setting out that the budgets of the contracting parties must be in line with the objective of balancing government accounts, which will be considered met if the annual structural balance of the general government meets the medium-term objective or respects the adjustment path towards this objective as set out in the Stability Program (SP). The local authorities are not among the contracting parties but the rules of the Cooperation Agreement apply to the collective government, including the local authorities. The Agreement also introduced a structural government budget balance rule at general government level. In this context, the annual budgetary targets of the general government, are distributed in nominal and structural terms among the various parts of the general government, based on the advice from the Public Sector Borrowing Requirements" (PSBR) Division of the High Council of Finance (HCF). A temporary deviation from the medium-term objective or from the adjustment path is only permitted in exceptional circumstances by the PSBR-HCF. It also sets out that a significant deviation of a contracting party in relation to its commitments must be immediately justified and take corrective action to put an end to the deviation within a period of 18 months, unless the economic or institutional reality justifies a longer period.

establishing credible, multi-annual budget plans and in monitoring outcomes.[14] Therefore, advancing cooperation among the federated entities would be an important step to adhere to medium-term budgetary objectives, to restore buffers, and to ensure fiscal sustainability.

- ***Recommendation 5:*** **Fully internalize the cost of overborrowing and recalibrate grant transfers.** The introduction of debt sustainability guidelines for subnational governments would help impose discipline with respect to overspending and debt financing. This would help, in turn, reduce the consolidation burden of the federal government and lower the risk of a deterioration of ratings. Grant transfers should preferably incorporate elements that improve incentives and outcomes, while transfers should be linked to demonstrated spending efficiency gains. This will be essential for the consolidation effort.

- ***Recommendation 6*****: Retain some flexibility in the pace and scope of fiscal decentralization.** When considering further fiscal decentralization, careful attention should be paid to: (i) reviewing if the federal government has retained a sufficient share of expenditures and revenues to conduct counter-cyclical policies to mitigate the impact of external or internal shocks; and (ii) the alignment of the pace of expenditure and revenue decentralization, to address vertical fiscal imbalances.

- ***Recommendation 7:*** **Improve the integration of fiscal sustainability objectives in structural reforms**. Structural reforms, including pension and labor-market reforms, should have clear fiscal consolidation objectives. More specifically, reform proposals should be accompanied by cost-benefit assessments and budgetary cost estimates—at the federal and subnational levels—to inform policy deliberations, agreement, and monitoring. In some cases, federal and regional competencies are closely associated (e.g., labor market intervention and support at the regional level and social protection spending, especially for unemployment benefits, sickness, and disability at the federal government). In these areas close coordination is particularly needed, including to align incentives and outcomes.

E. Conclusions

16. While fiscal decentralization progressed during 2015-19 vertical imbalances remained high. Devolution of spending from the federal government outpaced revenue decentralization. The resulting vertical fiscal gaps and reliance on grant-based transfers appear to have reduced spending discipline; this may have made control of rapid expenditure growth during 2020-22 even more challenging. Going forward, retaining some flexibility in the pace and scope of further devolution of competency and in the decentralization of fiscal resources will be important.

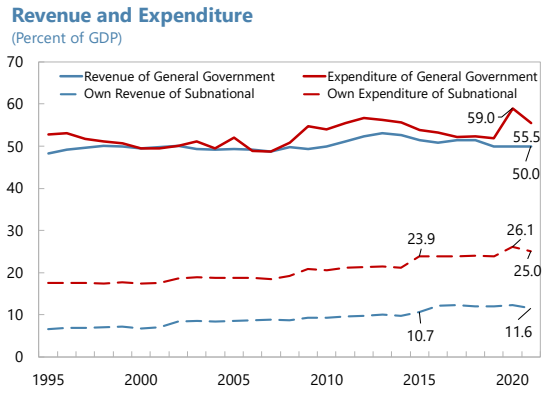
[14] The HCF recommends fiscal targets and provides normative policy assessments, and its "Public Sector Borrowing Requirements" (PSBR) section has specific competencies for intergovernmental fiscal coordination. The annual budget recommendations of the HCF-PSBR section were intended to serve as the basis for budgetary conventions and as "internal stability pacts" by setting the medium-term budgetary targets for the different levels of government (HCF and CoR).

17. Belgium's fiscal and debt sustainability has deteriorated after a series of shocks; this calls for urgent and concerted efforts to implement fiscal consolidation. Credible and systematic efforts are needed to rationalize spending, including systematically incorporating spending reviews in budgetary processes, applying strict spending limits, increasing revenues via tax and revenue administration reforms, and enhancing growth and employment through decisive structural reforms. In the context of Belgium's decentralized fiscal framework, linking expenditures and interregional transfers to spending efficiency should be enhanced.

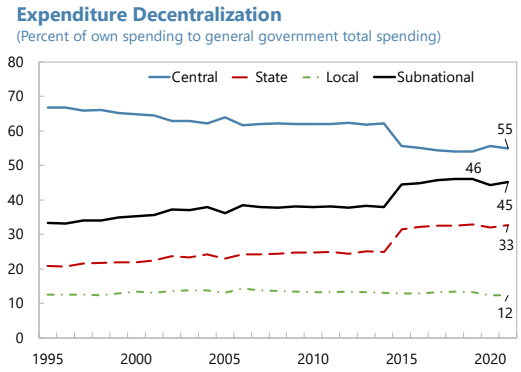
18. Fostering better fiscal policy coordination across all levels of government would improve the efficiency of Belgium's decentralized fiscal framework. Clear communication, strong fiscal institutions (fiscal rules and fiscal councils), a good track record on past fiscal performances, and importantly, political will for all levels of government would be needed to enhance fiscal credibility. In addition, implementing federal, regional, and community governments cooperation and burden sharing, as well, will be essential for the fiscal consolidation effort.

Figure 1. Belgium: Progress in Fiscal Decentralization (1995-2020)

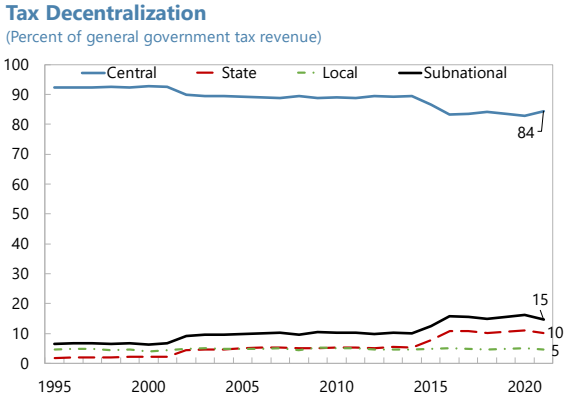
Subnational governments[1/] gained higher shares in their own revenue and expenditure since 2015…



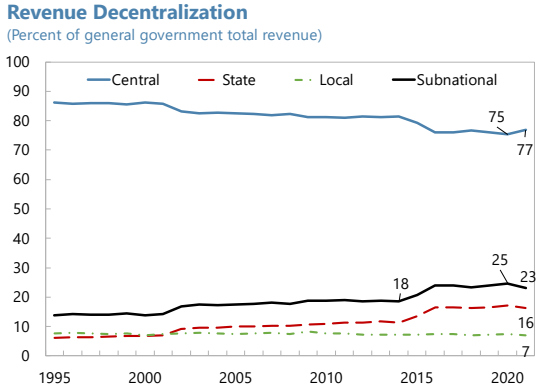
…with spending share reached 46 percent of general government total expenditure in 2019 before lowering slightly during the pandemic.



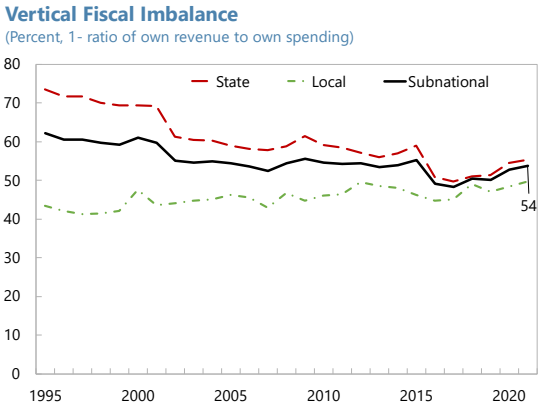
Subnational governments' own tax collection increased from 10 percent in 2014 to 16 percent in 2020…



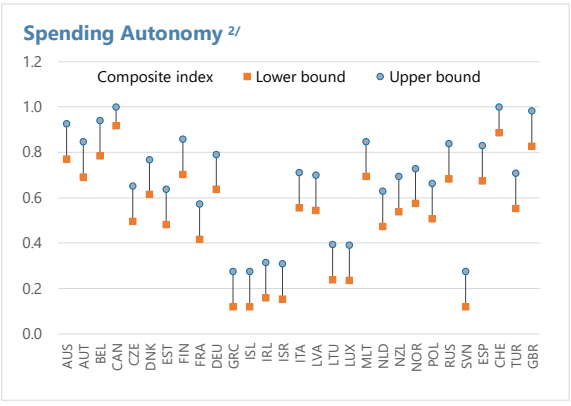
…while revenue, including inter-government transfers, rose from 19 percent to 25 percent of general government total revenue.



Vertical fiscal gaps have declined gradually but have risen again since 2018 due to faster spending increases.



Belgium ranks high in decentralized spending autonomy.

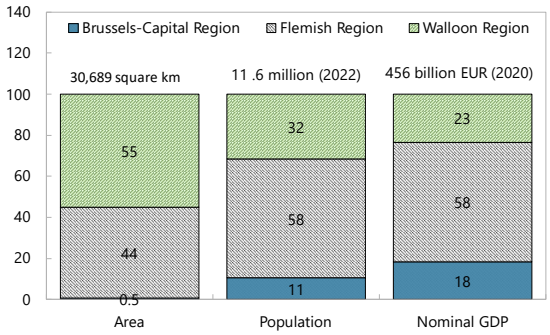


Sources: OECD Fiscal Decentralization Database and IMF staff calculation.
1/ Subnational government comprises state and local governments in the OECD Fiscal Decentralization database. This corresponds to regional and community governments, and local provincial and municipal authorities, respectively in Belgium.
2/ Composite spending autonomy indicator from OECD Fiscal Decentralization Database; scale of 0 (most centralized) to 1 (most decentralized).

Figure 2. Belgium: Economic and Social Characteristics by Regions

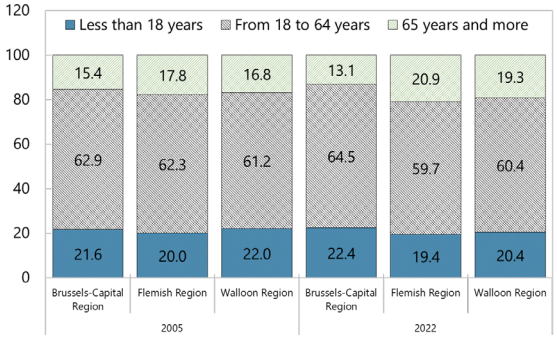
French-speaking Wallonia makes up over half of the land area but only a third of Belgium population.

Area, Population and GDP Size
(Percent)



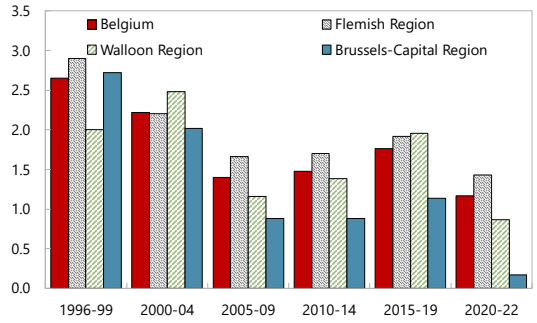
The densely populated Brussels-Capital Region (BCR) has a younger population with more inflow of immigrants.

Structure of Population
(Percent)



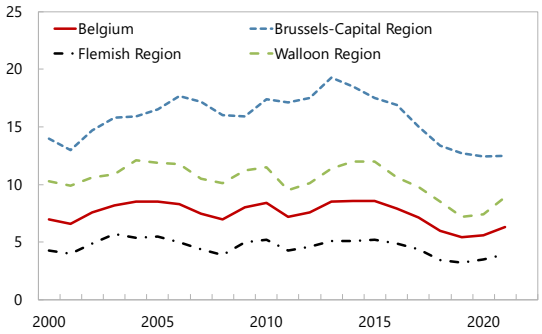
Dutch-speaking Flanders has higher economic growth…

Real GDP Growth
(Percent)



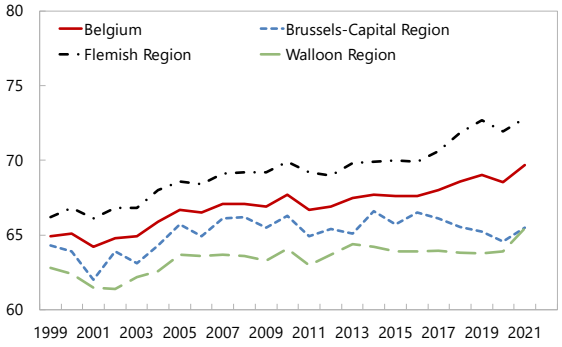
…with lower unemployment rate over the years.

Unemployment Rates
(Percent, 15-64 years) 1/



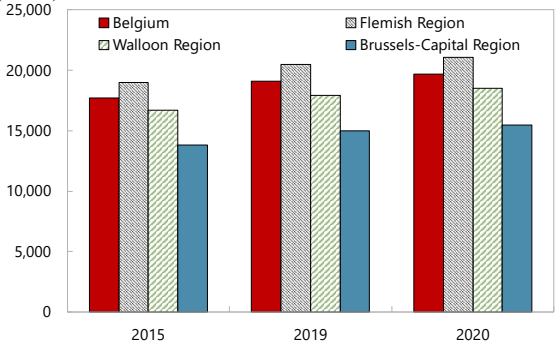
Activity rates are slow to rise in Wallonia and BCR.

Labor Force Participation Rates
(Percent, 15-64 years)1/



Flanders is richer with average tax income per capita above the national average.

Average Tax Income Per Population
(Euros)



Sources: StatBel; NBB; Federal Planning Bureau; and IMF staff calculation.
1/ As the Labor Force Survey has undergone considerable changes in collection methods and compilation methodology in 2017, the figures obtained before 2017 are not directly comparable.

Box 1. Belgium: Evolution of Fiscal Federalism in Belgium

The Belgian federation has three levels of government—the Federal government, the regional and community governments, and the local governments. The territory of the federal state is divided into six federated entities, comprised of three language communities (Flemish, French and German), and three geographical regions (Flanders, Wallonia and Brussels Capital), ten provinces, and 589 municipalities." 1/

Six state reforms took place in 1970, 1980, 198-89, 1993, 2001 and 2011, resulting in a progressive move from a unitary to a federated state. The Sixth State Reform enhanced the fiscal autonomy of the federated entities (e.g., regional personal income tax) and transferred more powers/competencies from the federal to the regional and community levels. There is no hierarchy between the federal authority, the regions and the communities—all three are equal from a legal perspective and are granted specific powers and responsibilities in different areas. The regions are competent in territorial matters (including economic development, transports, environment, housing) as well as employment, whereas the communities have competencies in language, culture and sports.

Box Table 1. A Summary of Belgian Six State Reforms and Fiscal Decentralization

Reforms	Key Changes in Institutions	Fiscal Decentralization and Changes in Financing
1970	Created three cultural communities	Grants from the Federal authority
1980	Established the Flemish Region and the Walloon Region; each community was given more power of decision and created its own parliament and government	The 1980 Act of Regionalization introduced a limited devolution of revenue-raising powers. Regional and community governments are permitted to levy taxes but non bis in idem with the exception of PIT, joint tax. Receiving transfers from part of the revenue of some taxes; and loans.
1988-89	Established a bilingual Brussels Capital Region	*Large scale expenditure decentralization.* Communities are given responsibility in education and the regions are granted responsibility in transport and public work. Equalization transfer introduced in 1990 to compensate regions if regional PIT per habitant is smaller than the federal level; "taxes collected by the federal government were transferred to sub-nationals by means of a set of "repartition keys." Two new grants for communities: a claim on VAT revenue for education; and a claim on PIT for other competencies.
1993	Creation of the Belgian Federal State	Due to the lack of resources, the French-speaking Community transferred competencies to Walloon region and Brussels French-speaking Community commission, but not all the corresponding means.

Box 1. Belgium: Evolution of Fiscal Federalism in Belgium (Concluded)

Reforms	Key Changes in Institutions	Fiscal Decentralization and Changes in Financing
2001	The Flemish Parliament became directly elected under the Lombard Agreement	*Strong push on revenue decentralization.* Established the Lambermont Agreement, among which the regions were granted an extension of their fiscal powers and the communities provided with financial measures. More tax autonomy for the regions: to levy positive or negative surcharges on PIT within a limit of 6.75 percent of the PIT. Refinancing of communities: additional grant and increased VAT claim for education; PIT adopted for the future.
2011	Substantial state reform will take place in several stages	*More competences were shifted from the federal level.* The regions were made responsible for territorial matters (e.g., infrastructure) in economy, employment and tax matters, and the communities become responsible for people related matters (e.g., culture, education), and family policy (e.g., healthcare, family allowance). The reform in 2011-13 included a first partial decentralization of Social Security (a transfer of 61 million euros); and decentralized competences of 20 billion euros, including child allowances (6 billion euros), employment policy (4 billion euros) and health policies (4 billion euros). Increased decentralized financing (e.g., increased tax autonomy of 12 billion euros and expanding regional PIT competences).

Sources: Gerard (2014); Peeters & Haljan (2016); Karpowicz (2012); and European Committee of the Regions (CoR) - Division of Powers.

The increase in budgetary autonomy of subnational governments granted in the sixth state reform includes the right to run fiscal deficits and to finance by borrowing. Regions and communities are authorized to issue debt on financial markets to fund current and capital expenditures while local governments (municipalities and provinces) can only borrow to fund investment projects. The federal authorities, based on recommendation of the High Council of Finance 2/, could, if considered it necessary, impose borrowing limits on regions if they have not respected their budgetary targets, to prevent endangering economic stability or the external balance 3/, while in practice, the implementation is likely far more complex.

1/ The institutions of the Flemish Community and the Flemish Region were merged at the beginning, such that one Parliament and one Government exercise both the regional and the community powers, to prevent the number of members of parliament to increase excessively.

2/The High Council of Finance, composed of members nominated by the federal, regional, and community levels, and the National Bank of Belgium, monitors and analyzes the borrowing requirements of all levels of government at regular intervals, and based on fiscal/debt sustainability, formulates recommendations about the medium- and long-term budgetary targets for the different government levels.

3/European Committee of the Regions (CoR) - Division of Powers; and Martinez-Vazquez and Vulovic (2016).

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FISCAL POLICY OPTIONS TO ACCELERATE EMISSIONS REDUCTIONS IN BELGIUM[1]

Belgium's current policies fall short of achieving its international climate targets and promoting emissions reductions at limited economic costs. Price-based federal reforms would help reduce greenhouse gas emissions and reinforce regional initiatives. These include economy-wide carbon pricing reinforced by sectoral policies:

- *A carbon tax that progressively increases to around €100 per tonne by 2030 for sectors not covered by the existing EU Emissions Trade Scheme (ETS)—namely, transportation, buildings, agriculture, and excluded industrial emissions. The tax should be phased in as international energy prices fall and ahead of the EU-wide ETS for buildings and transportation. Such a policy would promote cost-effective emissions reductions, bring Belgium closer to meeting mitigation commitments, reinforce regional policies, and act as a domestic price floor for the coming EU-wide ETS for buildings and transportation. Revenues should be used to compensate vulnerable households and trade-exposed firms and increase productivity, with direct support for firms phased out as the Carbon Border Adjustment Mechanism (CBAM) is phased-in. The tax should be extended to non-carbon greenhouse gases (e.g., methane) if administrative and political costs are manageable.*

- *A domestic price floor for sectors covered by the existing EU ETS—namely, industry and power—with the floor equal to the non-ETS sector carbon tax to increase investor certainty and equalize emissions prices across the economy.*

- *A feebate for the power and transportation sectors to promote decarbonization as nuclear power is planned to be phased out and to speed up electrification of the vehicle fleet. Transportation sector feebates should be coupled with the removal of the company car regime. Feebates for industry, building heating, and appliances could also be considered to promote cost-efficient, deeper decarbonization in these sectors and the needed renovation of the housing stock.*

- *Reduced fees and levies on electricity consumption for charges that are not directly related to delivering electricity to the end-user to allow for more cost-reflective pricing of electricity and promote switching from fossil fuel-based to electricity-powered activities.*

- *Transitioning from the current social tariff to a fiscally-sustainable, income-based social protection system with benefit levels that phase out as total income or wealth increases to improve employment incentives and decarbonization.*

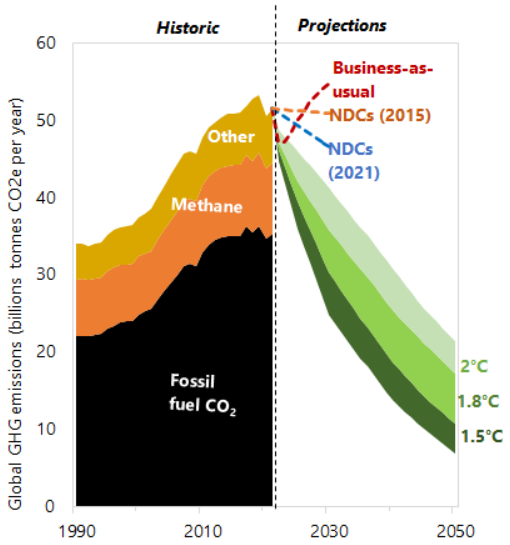
- *Promoting dialogue at the EU-level to harmonize ETS prices and include all sectors under a single trading scheme.*

[1] Prepared by Nate Vernon (IMF Fiscal Affairs Department), with comments from Mark Horton, Ian Parry, the National Bank of Belgium, and Belgium's Federal Planning Bureau.

A. Background

1. The window of opportunity to achieve warming targets and limit climate damages is closing. Limiting global warming to 1.5 to 2°C, the central goal of the Paris Agreement, requires cutting emissions of carbon dioxide (CO_2) and other greenhouse gases (GHGs) by 50 and 25 percent, respectively, by 2030 compared to 2019 levels, followed by a rapid decline to net zero emissions near the middle of the century (see Figure 1 and IPCC 2021). Over 85 countries, representing around 80 percent of current emissions, have communicated 'net-zero' targets by mid-century but intermediate mitigation targets and policies remain insufficient. [2] Under current policies, global emissions are expected to increase significantly to 2030, despite reductions caused by higher energy prices and the Covid-19-induced economic slowdown. Such an increase in emissions will contribute to more frequent and severe climate events and increase the risk of 'tipping points'.[3] Belgium's primary climate-related economic risks are heat-related productivity and health losses and flooding, with annual economic costs projected to be up to one percent of GDP by 2050 (see IMF 2021 for an overall review of climate-related costs).

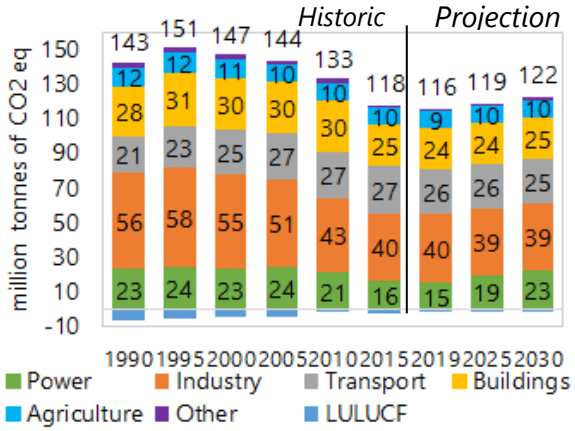
Figure 1. Belgium: Global GHG Emissions vs. Targets and Pledges



Source: IPCC (2021); and IMF staff using the IMF-WB Climate Policy Assessment Tool (CPAT).

2. Belgium's emissions in 2019 were 19 percent below 2005 levels (Figure 2). The industrial sector is the largest contributor to emissions (34 percent in 2019), followed by transportation (21 percent), buildings (20 percent), power generation (13 percent), and agriculture (8 percent). Emissions reductions have been realized in all major sectors except transportation and agriculture, with emissions in power generation, industry, and buildings falling by 38, 21, and 21 percent, respectively.

Figure 2. Belgium: Trends in Historical Emissions and Projections Under BAU Policies



Source: UNFCCC and IMF staff using CPAT.

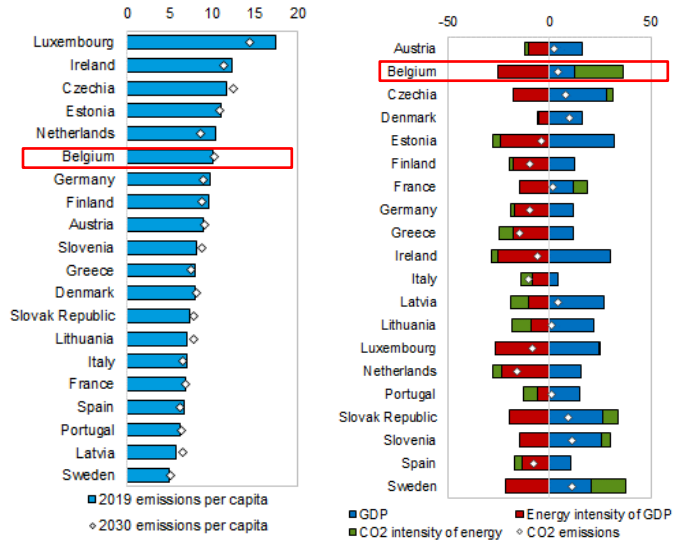
[2] Intermediate targets are primarily specified in Nationally-Determined Contributions (NDCs), which contain country-level targets. Target years for net zero emissions range from 2035 (Finland) to 2070 (India) (ClimateWatch 2022). Net zero emissions allows for negative emissions in some sectors and activities (e.g., forestry, direct air capture) to offset positive emissions in others. Some targets refer to CO_2 while others cover all GHGs.

[3] A tipping point is a threshold that, once crossed, would lead to large and irreversible climate impacts, such as melting of Arctic ice sheets.

Emissions in transportation and agriculture have remained relatively constant. Economy-wide emissions reductions slightly lag those of other advanced EU economies (24 percent below 2005 levels) and the EU as a whole (22 percent). Belgium's emissions per capita are similar to those of the Netherlands and Germany but on the higher end of advanced EU economies (Figure 3). Overall emissions-intensity is slightly below the EU average, but relatively high in the agriculture, heating, and road transportation sectors.

3. Belgium's emissions are projected to grow under current policies (i.e., no tightening of existing policies or additional policies).[4] By 2030, total emissions are estimated to increase to four percent above 2019 levels, with the increase driven by a higher power sector emissions-intensity due to the phase out of much of Belgium's nuclear generation capacity—nuclear power generated 45 percent of electricity in 2019 (compared to 27 and 10 percent from natural gas and wind, respectively, with the remainder split among solar, bioenergy, and coal). Natural gas power generation will rise, although an increase in wind power generation partly offsets the switch from nuclear to natural gas.[5] Industrial, transportation, building, and agricultural emissions are projected to remain relatively stable. In line with other advanced EU economies, the energy-intensity of GDP should fall, partly due to increased energy efficiency improvements induced by higher natural gas and oil prices and the introduction of newer, more efficient technology.

Figure 3. Belgium: Emissions Trends across Europe



Source: UNFCCC, Eurostat, IMF Staff estimates using CPAT.
Note: international comparison reflects existing policies as of December 2022.

4. Without more ambitious policy actions, Belgium will fall short of its key, binding emissions-reduction target (Table 1). Under the EU Effort Sharing Regulation (ESR), Belgium is required to reduce emissions to 47 percent below 2005 levels by 2030 for activities not included in the existing EU Emissions Trading Scheme (ETS)—the EU ETS covers power and large industrial

[4] Analysis is done using the IMF's Carbon Pricing Assessment Tool (CPAT). CPAT has been developed jointly by IMF and World Bank staff and evolved from an earlier IMF tool used, for example, in IMF (2019a and b). For descriptions of the model and its parameterization, see IMF (2019b), Appendix III, and the Appendix of Black et al (2021). Results generally align with EEA (2022) and Leuven (2022). See Annex and Table 4 for more details.

[5] Belgium has committed to phase out nuclear power generation by 2035 (one reactor has already been decommissioned). Additional wind generation came online in 2020 and increased total offshore wind capacity by about 20 percent. A large, additional increase in wind power capacity is expected starting in 2025.

activities. The required 47 percent reduction compares to a projected decline of 11 percent by 2030 under current policies. The additional policies described in Belgium's National Energy and Climate Plan (NECP) do not close the gap, with overall emissions falling by 28 percent, split between a decline of 35 and 22 percent for non-ETS and ETS sectors, respectively (EEA 2022).[6] Failing to meet ESRs and other targets will result in financial costs, potentially through purchasing 'statistical transfers' from member states that overachieve on their targets or using additional flexibilities. Table 1 summarizes the Belgium's targets and projected emissions reductions.

Table 1. Belgium: Summary of Mitigation Targets

Scope	Target (relative to 2005 unless noted)	Assessment (relative to 2005) 3/	
		2019	2030
ETS sectors, emissions	No explicit targets	-27%	CPAT: -20% (WEM) EEA: -14% (WEM), -19% (WAM)
Power, emissions	NECP: -100% by 2050, no 2030 target	38%	CPAT: -10% (WEM) EEA: 4% (WEM), -4% (WAM) 1/
Industry, emissions	NECP: -33% in 2030, -79% in 2050 for non-ETS industry	-21%	CPAT: -24% (WEM) EEA: -25% (WEM), -29% (WAM) 1/
Non-ETS sectors, emissions	ESR: -47% in 2030 NECP: -35% in 2030, -85 to 87% in 2050; Flanders (-40% in 2030, -85% in 2050); Wallonia (-35% in 2030); Brussels (-40% in 2030)	11%	CPAT: -10% (WEM) EEA: -10% (WEM), -35% (WAM)
Transport, emissions	EU: -55% reduction by 2030 relative to 2021 2/ NECP: -27% in 2030, -100% in 2050; Wallonia (-24% by 2030);	3%	CPAT: -6% (WEM) EEA: 4% (WEM), -32% (WAM)
Buildings, emissions	NECP: no explicit federal target; Wallonia (-29% by 2030)	-21%	CPAT: -18% (WEM) EEA: -24% (WEM), -44% (WAM)
Agriculture, emissions	NECP: -23% in 2030, -47% in 2050	-4%	CPAT: 1% (WEM) EEA: -8% (WEM), -18% (WAM)
Economy-wide, emissions	NECP: no explicit federal target, Wallonia (-30% by 2020 and -95% by 2050, compared to 1990), Brussels (-40% in 2030, 'approach net zero' by 2050), Flanders (no explicit target)	-19%	CPAT: -16% (WEM) EEA: -13% (WEM), -28% (WAM)
Power, renewable share	EU: 25% of gross final energy consumption by 2030 NECP: 17.5% of energy consumption by 2030	9.9%	CPAT: 16.7% (WEM)

Source: National Energy and Climate Plan (2019), Flemish Energy and Climate Plan, IMF staff estimates using CPAT, EEA 2022.

1/ Power in the EEA analysis includes petroleum refining and manufacture of solid fuels, while these activities are included in industry for the IMF analysis.
2/ Reflects proposals in the Fit for 55 package.
3/ WAM refers to 'with additional measures' and accounts for policies that are in the planning stages but have not been implemented, while WEM refers to 'with existing measures' and only considers policies that are currently being implemented.

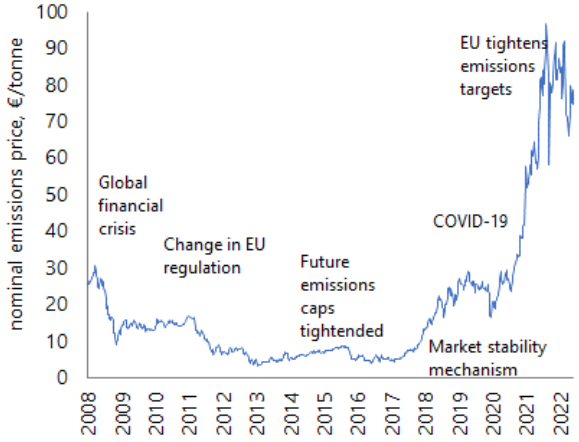
[6] Although the additional policies were designed to comply with the less stringent, pre-'Fit-for-55' ESR target and it is not yet clear whether revised a NECP, slated for 2024, will close the gap.

5. This paper evaluates fiscal policies to promote cost-effective emissions reductions in Belgium. Specifically, the analysis covers economy-wide carbon pricing; reinforcing sectoral policies, such as feebates; policies to reduce the relative price of electricity to support electrifying traditionally fossil-based activities, such as transportation; and the energy-related aspects of the social protection system, including the recent policy response to the current energy crisis. The analysis builds off previous work by the IMF, European Commission, OECD, IEA, Belgian institutions, and others.[7] The paper first provides an overview of Belgium's climate policies then assesses the reform options. The Belgian authorities—at the federal and regional levels—are closely engaged in a series of reforms related to energy and climate policies, including updating climate and energy plans and considering tax changes. A Tax Blueprint was presented by the federal financial minister in July 2022 and called for more extensive carbon pricing in non-ETS sector to support emission reductions efforts. This paper aims to contribute to the policy debate.

B. EU and Belgian Policies

6. The centerpiece of EU climate policy action is the ETS, which covers large emissions sources from energy, industry, and within-EU aviation. The ETS works on the 'cap and trade' principle, where a cap is set on the total amount of GHGs that can be emitted at the EU level, while companies buy or sell allowances, which establishes the emissions price. The EU scheme currently covers about 41 percent of total EU GHGs (WBG 2022). Presently the cap declines by 2.2 percent each year, but this rate is expected to increase to 4.3–4.4 percent annually to comply with the new 'Fit-for-55' target. EU allowance prices rose to around €80 per tonne in September 2021 and have since hovered around this level (Figure 4). Drawbacks of the ETS include volatile emissions prices, which creates uncertainty for investors, and also that with a fixed cap on emissions at the EU level, emissions reductions from overlapping policies for ETS sectors in Belgium are offset by extra emissions in other EU countries via a decline in the ETS allowance price (i.e., full leakage). This problem is, to some degree, mitigated by the Market Stability Reserve (MSR), which withdraws emissions allowances from the system

Figure 4. Belgium: Daily EU ETS Price



Source: Ember (2022)

[7] For example, the European Commission (2020) found gaps in climate policy coordination and design; the OECD (2022) found low carbon prices in the buildings and industrial sectors; the IEA (2022) noted that taxation and social protection reform may promote price signals that drive least cost decarbonization; the National Carbon Pricing Debate (2018), the National Bank of Belgium (2021), and Transport and Mobility Leuven (2022) found that carbon pricing is generally low, and higher prices could cost-effectively reduce emissions; and the IMF (2021) found carbon pricing and subsidy removal, with policies to support vulnerable households, could form part of a mitigation package.

(sometimes permanently) when the amount of banked allowances (i.e., that firms have purchased but not yet used) exceeds a threshold level. Energy intensive, trade exposed (EITE) industries (e.g., metals, chemicals) have historically been granted free allowance allocations to address competitiveness and leakage concerns, but these are expected to be phased out as the recently-agreed EU Carbon Border Adjustment Mechanism (CBAM) is introduced.

7. In December 2022, the European Commission and the European Parliament provisionally agreed to introduce a separate ETS for road transportation, buildings, and other sectors. The new ETS would be introduced in 2027 (or 2028 if energy prices are 'exceptionally high'), with the price of allowances not exceeding €45 per tonne and the allowance cap set to an annual, linear decline of 5 percent per year from 2024 emission levels. The agreement provides an exemption for member states in which there is a national-level carbon tax equal to or above the ETS allowance price. A portion of the revenues from the ETS will support vulnerable households and small businesses through the Social Climate Fund.

8. Additional EU-level policies are generally issued through directives and regulations and are, at times, binding. Key directives include: (i) the Energy Taxation Directive (ETD), which provides minimum excise duties on energy products and electricity; (ii) the Renewable Energy Directive, which sets renewable energy targets for electricity, heating, cooling and transportation and is legally binding as of 2021; (iii) the Energy Efficiency Directive, which provides binding energy consumption reductions relative to a baseline level; (iv) the Energy Performance of Buildings Directive, which requires each member to provide a long-term renovation strategy for buildings and phases in minimum energy performance standards for buildings; and (v) CO_2 emissions performance standards for road transportation, which become progressively more stringent and will require all new passenger vehicles and vans to be zero-carbon by 2035.

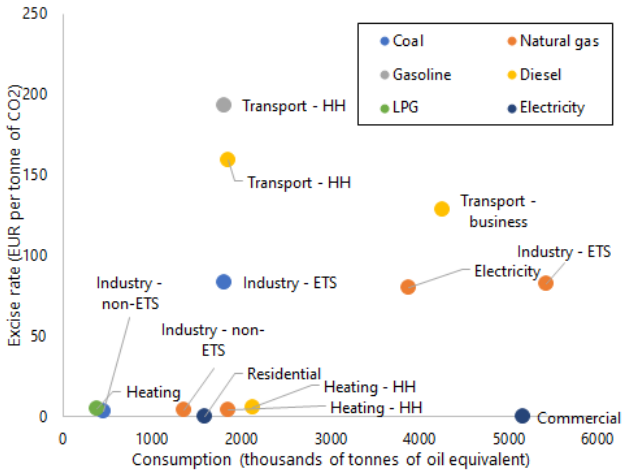
9. Belgium's regional and federal governments share competencies over domestic policies impacting emissions reductions. Specifically, regions control policies related to electricity and natural gas distribution (including tariffs), district heating networks, onshore renewable energy, waste management, public transportation, urban and rural planning, agriculture, building and vehicle efficiency requirements (except for federal buildings), and vehicle registration. The federal government is responsible for tax policy, offshore renewable energy, nuclear energy, energy R&D, energy pricing policy, and the national rail system. There are forums to support coordination between regions and the federal government (such as the National Climate Commission), but these do not ensure binding coordination.

10. Excises are Belgium's main instruments to (indirectly) price carbon emissions, but current rates result in substantially different carbon prices across fuels and activities (Figure 5). Excises on unleaded petrol and diesel are €193 and €160 per tonne of CO_2 (€0.45 per liter of fuel), respectively, when the fuels are used for transportation but are significantly reduced (to around €0.02 per liter) for other diesel uses, such as heating and non-transportation commercial activities. Moreover, a portion of the excise charged on transportation diesel for professional use is refunded (the refund was €0.08 per liter most recently). Other fuels are lightly taxed—notably the excises on natural gas and coal, with maximums of €0.31 and €0.37 per GJ (equivalent to around €4.3 per tonne

of CO_2) and exempt in many cases. The electricity excise is €0.50 and €2.93 per MWh for commercial and residential use, and the biofuel content of blended fuels is taxed at the rate of the fossil fuel (e.g., diesel with biofuel is fully taxed at the diesel rate). The VAT is also applied to energy consumption and impacts prices paid by residential consumers—the standard VAT rate is 21 percent but has been reduced to 6 percent for natural gas, district heating, and electricity.[8]

11. Fossil fuel subsidies, such as reduced excise rates and social tariffs, result in a large fiscal cost and primarily support natural gas, heating oil, and company cars purchases. Reduced excise duties, especially those for natural gas and heating oil, made up the bulk of subsidies at €10.5 billion in 2019 (around 2.2 percent of GDP).[9] Preferential tax treatment for company cars and road fuel subsidies is also significant at around €2.5 billion and growing. The cost of the social tariff, which provides reduced natural gas, heating oil, and electricity prices to vulnerable households, has historically been relatively low but has increased with the expanded coverage introduced during the recent energy crisis (now around 20 percent of households) and higher per-unit level of natural gas subsidy.[10] Overall, around 40 percent of subsidies were provided for heating and electricity, 30 percent for transportation, and 25 percent for industry. Although total subsidies decreased from 2015 to 2019, recent policy decisions (i.e., expanded social tariff coverage and reduced VAT on natural gas, district heating, and electricity) and international price developments are likely to reverse the recent trend. Box 1 provides more detail on recent policy changes and support measures in response to the 2022 energy crisis, as well as impacts on purchasing power.

Figure 5. Belgium: Excise Rates and Consumption by Fuel and Use



Source: Eurostat.
Note: Electricity does not emit carbon when consumed but presented as a rate of zero.

12. The combined effect of the excise, VAT, and social protection systems results in effective carbon tax rates that are particularly low for buildings and agriculture (Figure 6). Road transportation and power sector carbon taxes are broadly in line with the EU average and slightly above the average among OECD countries, but still below that of neighboring countries and

[8] The reduced VAT rates are currently temporary but may be made permanent and coupled with higher excise rates for residential energy use to result in an effective tax rate similar to that under 2021 natural gas and electricity prices.

[9] Excise duty subsidies are measured as the gap between various fuel excise rates and the excise rate on unleaded petrol (FPS 2021)

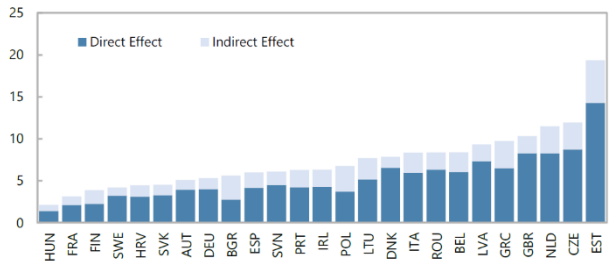
[10] Social tariff rates are set every 3 months at the lowest retail, distribution, transmission components of tariffs over previous periods with limits on how much they can increase each quarter (IEA 2022). The limited rise in quarterly rates means that the level of the subsidy increases when energy prices surge, such as 2022.

levels needed to meet emissions-reductions targets. The industrial, buildings, and agricultural, fish, and forestry sectors lag levels elsewhere in the EU, OECD, and in neighboring countries. In the industrial sector, this is due to low natural gas and coal excise rates compared to other EU countries and a significant portion of emissions that are not covered by the ETS (around 20 percent of industrial sector emissions).[11] Low carbon price levels for buildings and agricultural, fish, and forestry are driven by reduced excise rates for diesel (when used for heating) and natural gas.

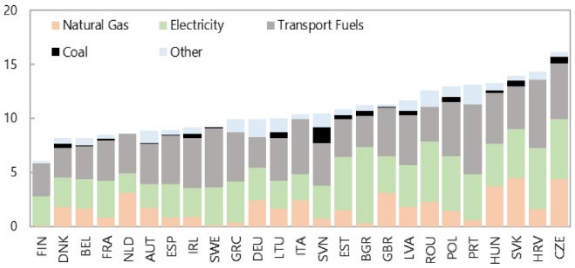
Box 1. Belgium: Response to the 2022 Energy Crisis

Surging energy prices in 2022 impacted a significant share of household consumption, with lower-income households particularly exposed. Electricity, natural gas, and oil products make up 3.9, 2.1, and 3.5 percent of total household consumption, respectively, for the lowest 20 percent of the income distribution.

Household Burdens



Budget Hares



The federal and regional governments introduced swift measures to assist households and firms. These cost about 1.7 percent of GDP and include reduced VAT for natural gas, electricity, and district heating; reduced excises on petrol and diesel; additional cash transfers; and expanded eligibility for the social tariff. Roughly 1/3 of measures are targeted and distort price signals, while 2/3 are untargeted and not price distortionary. Automatic wage and social benefit indexation, as well as limits to social tariff energy price increases, provided additional boosts to household purchasing power.

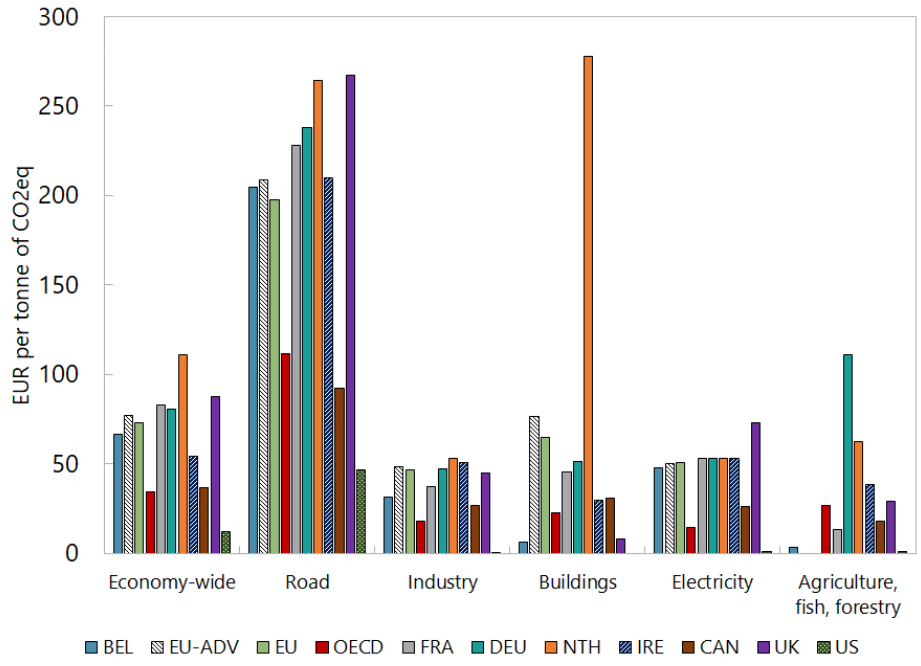
Ideally household assistance should be targeted (to limit fiscal costs) and unrelated to energy consumption (to preserve incentives for energy conservation). In this regard, the government plans to introduce a flexible excise rate that declines for base levels of consumption as natural gas and electricity prices rise. Improving targeting mechanisms through matching tax, household size, and third-party data (as legally possible) is a medium-term exercise that could improve social benefits during regular times and prepare for future energy shocks, which could become more frequent under a disorderly energy transition.

13. The authorities are considering reforms related to energy and climate policies, including possibly increasing carbon prices on non-ETS sectors. A Tax Reform Blueprint was presented by the federal finance minister in July 2022, containing measures to be introduced in subsequent budgets. The Blueprint notes the importance of more extensive carbon pricing in non-ETS sectors to support emission reductions efforts. While the recently-reduced VAT rates for natural gas and district heating are likely to be made permanent, the government plans to raise excises to levels that allow for 2021 post-tax prices to be reached and to make the portion of the excise

[11] Seventeen percent of industrial emissions were from non-ETS contributions as of 2015-16. Non-ETS industry emissions comprised 65 percent energy vs. 35 percent processes, and primarily came from the chemical (37 percent) and food, beverages, and tobacco (17 percent) sectors (Climact 2018). Also, emissions from biomass are not covered by the EU ETS and are estimated to make up around four and 10 percent of energy use for industrial and electricity generation, respectively (Eurostat 2022).

applicable to base electricity and natural gas consumption vary with energy price spikes, as a way to support base levels of energy consumption. There is an understanding that energy taxation needs to shift from electricity to fossil fuels. This could entail a progressively rising excise rate on natural gas (and other fossil fuels), potentially through carbon pricing.

Figure 6. Belgium: Effective Carbon Tax Rates by Sector in 2021



Source: OECD 2022

C. Reforming Existing Fuel Taxes and Introducing Economy-Wide Carbon Pricing

14. Carbon pricing for non-ETS sectors should be at the center of federal decarbonization reforms, as it has environmental, fiscal, economic, and administrative advantages over other mitigation instruments.[12] Carbon pricing provides across-the-board incentives for firms and households to reduce energy consumption and shift to cleaner fuels without favoring any specific energy matrix, other than discriminating by its carbon content (by reflecting the cost of carbon emissions in the prices of fuels, electricity, and other intermediate and final goods). It also automatically minimizes mitigation costs by equalizing the cost of the last tonne of emissions reduced across fuels and sectors ('marginal abatement cost'); it mobilizes valuable revenues; and it generates domestic environmental benefits (e.g., reductions in local air pollution mortality). Carbon pricing is administratively straightforward and can build on the existing excise tax system.

15. Good carbon pricing strategy covers emissions comprehensively, establishes predictable prices, aligns stringency with mitigation goals, and exploits fiscal opportunities.

[12] See, for example, IMF (2019a and b) and Stern and Stiglitz (2017).

Introducing a carbon price for non-ETS sectors, combined with the EU ETS, would ensure that fossil fuel emissions in Belgium are comprehensively covered by pricing schemes. Efficiency benefits are achieved through equalization of abatement costs across the economy, by coupling the non-ETS carbon price with a price floor for ETS sectors. Progressively increasing the policy's stringency with a price path announced well in advance allows households and firms to adjust input choices and spending decisions (making it more acceptable and efficient), helping promote investment in clean technologies with longer payback periods, such as electric vehicles and heat pumps. Carbon pricing should also raise revenue, which can be used for support of both vulnerable households and firms with the remainder used to improve productivity.

Box 2. Belgium: Carbon Taxes vs. Cap-and-Trade Systems

Certainty and investment. Carbon taxes may provide greater price certainty, which supports investment in energy efficiency and clean technology. This is especially important for investments with long payback periods, such as power generation, electric vehicles, and residential energy efficiency improvements. This benefit of the carbon tax is diminished if the price trajectory is not credible, or the tax is adjusted frequently (perhaps due to public resistance or a view that the tax will need to be increased in the future to meet legally required emissions targets). To date, ETS prices have been volatile (Figure 4), increasing risks and uncertainty and abatement costs (studies show 15 percent higher marginal abatement costs under an ETS due to the uncertainty in future prices (Fell, MacKenzie, and Pizer 2021))—this deters private innovation and adoption of clean technologies, especially in activities with long payback periods. This weakness can be alleviated by including a price floor, such as in the UK, Denmark, and in the Netherlands' power sector (see Flachsland and others (2018) for further discussion of price floor mechanisms). The market stability reserve (MSR) acts as a weak version of a price floor.

Administration. Carbon taxes are easier to administer as they typically build off the existing fuel tax regime and can be applied at the point of fuel refining/processing or importation (midstream), with rebates provided to downstream firms that capture emissions. This omits industrial process emissions, but these can be captured through actual measurement. ETS have been applied downstream at large stationary sources in power and industry, although the German, Californian, Austrian, and Korean ETS cover heating and transportation.

Revenues. The carbon tax generates government revenues, while the ETS only does so if allowances are auctioned. There has been a tendency to grant free ETS allowances to build political support and protect energy-intensive, trade-exposed firms (EITE). Generating revenue provides much greater flexibility since revenues can be used to promote social (e.g., income support to vulnerable households and firms) or economic objectives (e.g., reducing labor taxes), while free allowances can generate windfalls for low-emitting firms in the short-term depending on the distribution. For policies that generate revenues, competitiveness can be protected, and carbon leakage reduced by providing output-based rebates or imposing carbon border adjustments. However, international coordination for carbon pricing (or other mitigation policies) is the most efficient approach as it covers emissions much more comprehensively (see Parry et al. 2021a for more).

Overlapping policies. The carbon tax is more compatible with other policies (e.g., feebates, emission rate regulations, clean technology subsidies) since the other policies provide additional incentives, on top of the carbon tax. For an ETS without a price floor, the quantity emitted is fixed so other policies to promote clean energy or disincentive emitting energy will result in a lower ETS price and, therefore, do not reduce emissions—this effectively results in the subsidy having a fiscal cost without any benefit but can be alleviated through a price collar (a price floor on the ETS price).

16. Carbon pricing can take the form of either a carbon tax or cap-and-trade system (i.e., ETS). A carbon tax is simply a tax on the carbon content of fossil fuel supply, while a cap-and-trade scheme requires firms to have allowances to cover emissions, with the allowance cap set by the government and a market for trading of allowances across firms. The carbon tax provides certainty over the carbon price, while the ETS provides certainty over the emissions level. See Box 2 and Parry et al (2022a) for more.

17. Several other European countries have carbon pricing of non-ETS sectors, and some are introducing price floors to the ETS. Currently, prices for non-ETS sectors vary from €35 to €110 per tonne (Table 2) and all are effectively taxes (i.e., no ETSs) since Germany and Austria have fixed, progressively increasing levies until 2026, at which time they plan to transition to a price determined in ETS markets—Germany will have a price floor and ceiling. The policies only cover non-ETS sectors, except for Finland, Ireland, and Portugal where a portion of industrial emissions are taxed. Denmark, the Netherlands, and the UK have or are considering a price floor for power and/or industry—such a policy has the benefit of providing price predictability, which is important to incentivize investment with long payback periods (e.g., power generation and industry), and equalization abatement costs across the economy if the price floor is equal to the non-ETS carbon price.

Table 2. Belgium: Carbon Pricing in Non-ETS Sectors

Country	Year intro.	Type	Price € / tonne	Sectors
Austria 1/	2022	Tax to ETS	35 (2023) to 55 (2025)	Heat, Tran.
Denmark	1992	Tax	47 (2022) to 101(2030)	All 2/
Finland	1990	Tax	77 (2022, Tran.), 53 (2022, other)	Heat, Tran., Ind.
France	2014	Tax	45 (2022)	Heat, Tran., Ind. 3/
Germany 1/	2021	Tax to ETS	30 (2022) to 55 (2025)	Heat, Tran.
Ireland	2010	Tax	34-41 (2022) to 100 (2030)	Heat, Tran., Ind. 4/
Portugal	2015	Tax	Previous years' avg. ETS price	Heat, Tran., Ind.
Sweden	1991	Tax	110	Heat, Tran.

Source: WBG 2022.

1/ The price is fixed until 2026, at which point it will be subject to ETS market conditions.
2/ lower rate for ETS sectors.
3/ ETS sectors are exempt.
4/ Other sectors are covered but with several exemptions.

18. A carbon price could bring Belgium significantly closer to its mitigation targets with manageable costs.[13] Table 3 shows mitigation reductions and other outcomes under a carbon price

[13] These results are valid whether EU-wide or national carbon pricing is imposed on non-ETS sectors. Modelling assumes that the carbon price is applied to all greenhouse gas emissions (i.e., methane). Emissions reductions would be lower in the agricultural sector if the policy is only applied to carbon as the majority of agricultural emissions are from methane and nitrous oxide.

in Belgium for non-ETS sectors and a price floor for industry and power (i.e., the tax only applies if the price levels exceed the EU ETS price). Results show that, for example, a tax progressively reaching €75 per tonne reduces overall emissions to 25 percent below 2005 levels in 2030 (or 12 percent below a Business-as-Usual (BAU) scenario),[14] while raising revenue of 0.6 percent of GDP and not making people worse off (the economic efficiency costs of 0.2 percent of GDP are offset by improved health, reduced congestion, among others).[15] At the sectoral level, the response to additional carbon pricing depends on how the pricing affects future energy prices and assumptions about the price responsiveness of the use of fuel and electricity in each sector. Emissions decline by 1 percent (power), 19 percent (industry), 6 percent (transportation), and 13 percent (buildings) compared to BAU levels.[16] Agricultural emissions (primarily methane and nitrous oxide, rather than CO_2) have a modest price responsiveness at low carbon price levels, but are more costly to deeply abate (see Parry et al (2022b)). However, as carbon pricing even at relatively high levels (e.g., €125 per tonne) does not achieve mitigation targets, reinforcing sectoral policies are required. These are discussed in the subsequent section.

Table 3. Belgium: Sectoral Emissions Outcomes, 2030 Relative to 2005 Levels

			Carbon price (€ per tonne of CO_2eq)					
Scope	Target	2019	0	25	50	75	100	125
Non-ETS	-47	-11	-10	-14	-17	-19	-21	-23
Transport	-27	-3	-6	-8	-10	-12	-13	-15
Buildings		-21	-18	-21	-25	-28	-31	-34
Agriculture	-23	-4	1	-8	-9	-10	-12	-13
ETS		-21	-18	-23	-27	-30	-33	-38
Power		-39	-10	-11	-11	-11	-11	-17
Industry		-21	-24	-30	-34	-39	-44	-48
All		-19	-15	-20	-22	-25	-28	-32
Ren. share	17.5	9.6	17	18	18	19	19	20
Revenue raised (% GDP)				0.2	0.3	0.6	0.8	1.1
Efficiency costs (% of GDP)				-0.1	-0.2	-0.3	-0.4	-0.6
Welfare benefits (% GDP) 1/				0.0	0.0	0.0	-0.1	-0.2
Deaths averted 2/				50	72	93	114	132

Source: IMF Staff estimates using CPAT.

1/ welfare benefits refer to the benefits from reduced air pollution net of losses to consumer welfare caused by higher taxes.
2/ see Parry et al. 2021b for more on air pollution co-benefits.

19. A practical and effective reform for Belgium would be to phase in a carbon price on non-ETS activities and introduce a domestic carbon price floor for those covered by the EU ETS, as international energy prices fall. This would lead to lower post-tax prices, as compared to

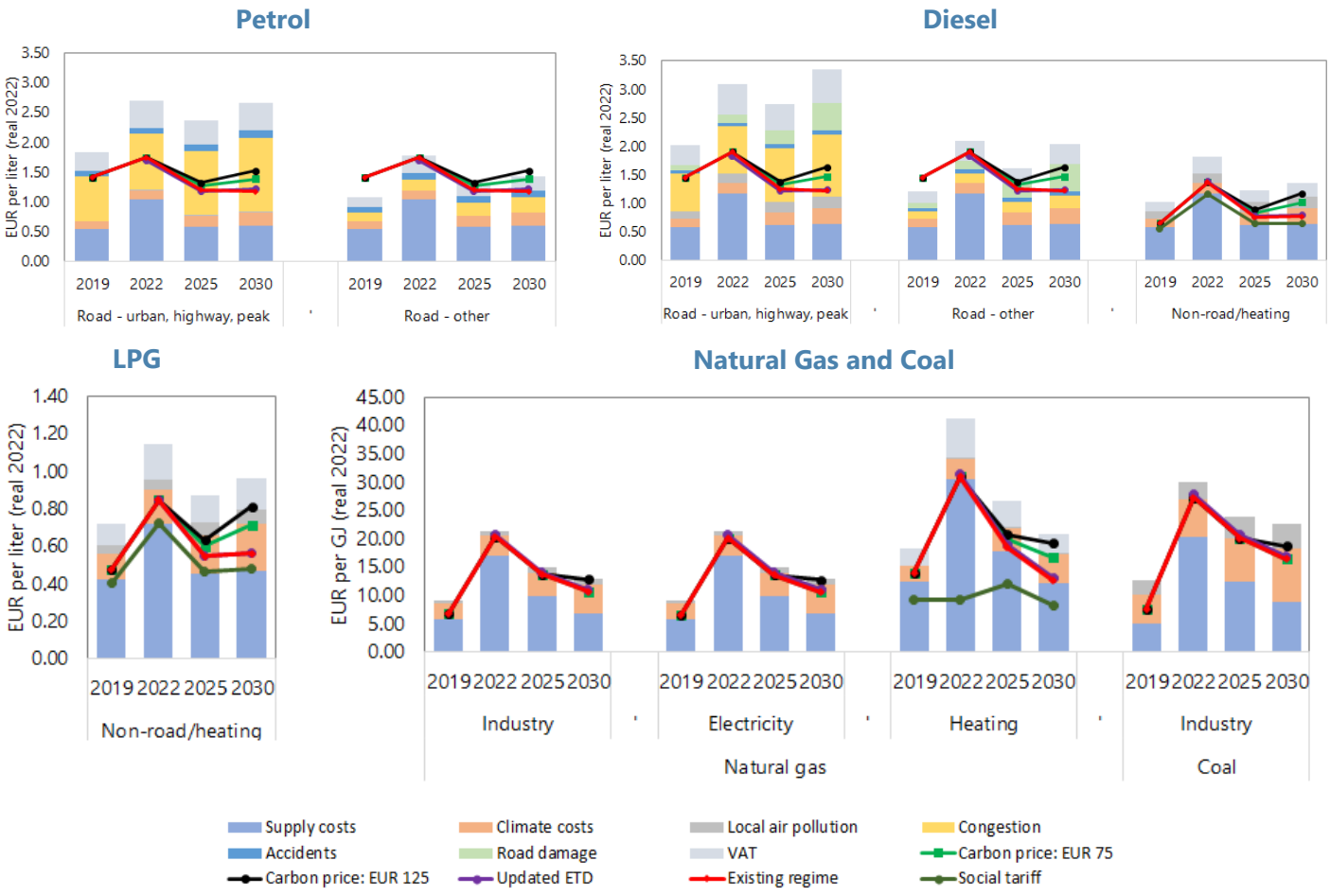
[14] The BAU scenario only considers existing fiscal policies and, thus, does not consider the planned EU ETS for transportation and buildings nor regional renovation obligations.

[15] The efficiency cost of non-pricing mitigation policies is larger but less visible to the consumer and more difficult to quantify. For example, a subsidy for clean technology must be funded through taxes or borrowing—taxes on activities that are beneficial to society (such as working or investment) reduce value-generating activities and, thus, impact GDP and consumption levels, which also lead to efficiency costs but are more difficult to quantify.

[16] Price responsiveness of the power sector, transportation, and buildings are relatively low—due to the slow turnover of the vehicle and building stock—but emissions cuts are still significant, except for power. In the power sector, capacity committed to natural gas through the Capacity Remuneration Mechanism and the fact that the tax only applies above the EU ETS prices limit reductions.

current levels, assuming that international energy prices fall in line with futures markets and would help return the relative price of natural gas to coal closer to pre-crisis levels (Figure 7). The overall tax system, with a carbon tax of €125 by 2030 would nearly result in fully efficient pricing of externalities.[17]

Figure 7. Belgium: Price Impacts of Carbon Pricing, Compared to Efficient Levels



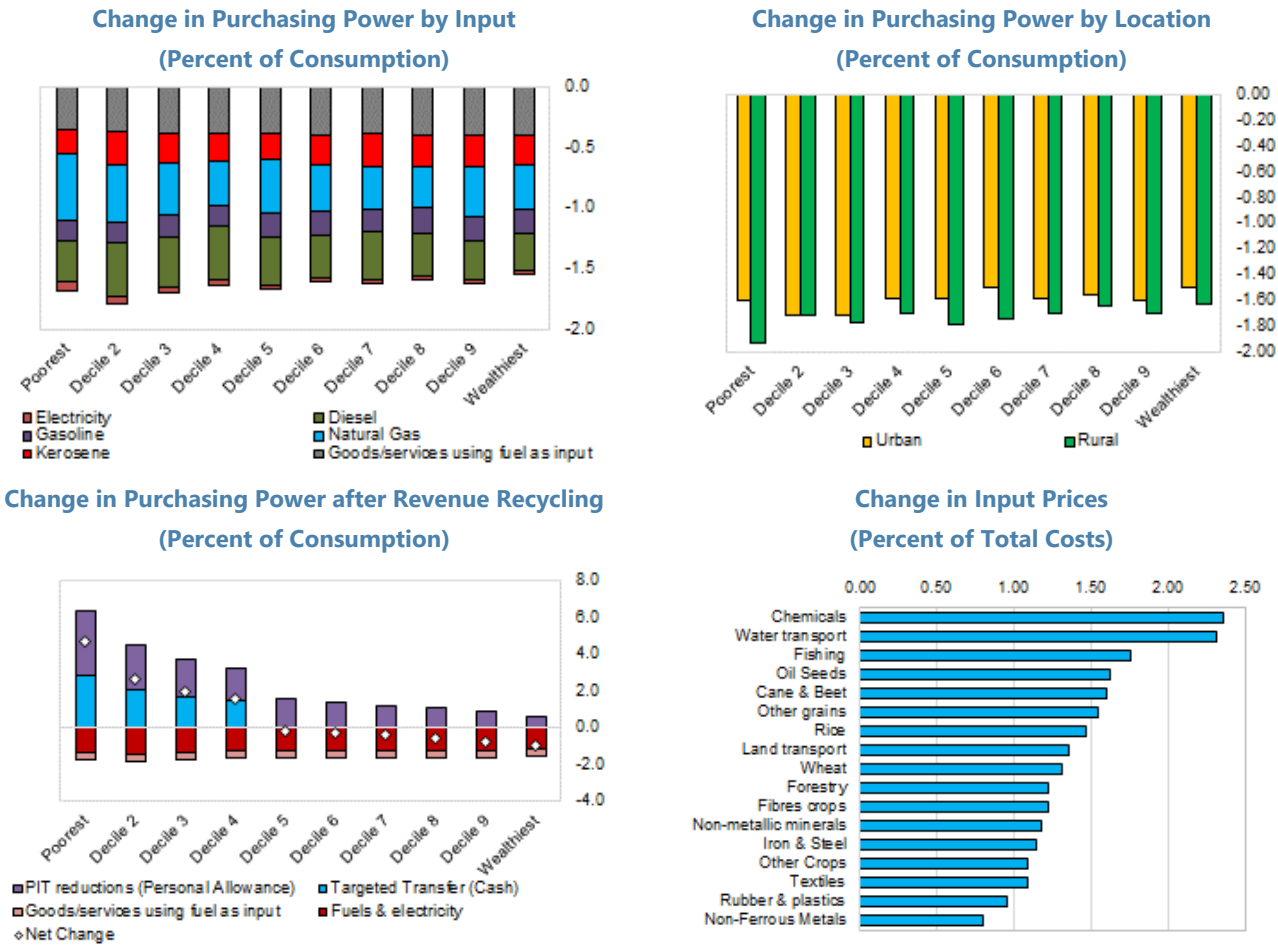
Source: IMF Fossil Fuel Subsidy Database (Parry and others, 2021) and IMF Staff estimates.

Note: This assumes a global warming cost consistent with a least-cost trajectory to meet global temperature stabilization goals (USD 40-60 per tonne in 2020, growing to 50-100 in 2030) Stern and Stiglitz (2017). The ratio of congestion costs between urban roads and highways during peak hours to other road transport roughly aligns with Hoornaert and Steenbergen 2019.

[17] The economically efficient (i.e., first-best) fuel pricing regime includes full passthrough of commodity supply costs (labor, capital, and raw materials), a carbon tax equal to the damage from CO2 emissions (or in line with meeting emissions reduction targets), an excise equal to the cost of local externalities caused by fossil fuel combustion, and the standard VAT rate. Such an economically optimal regime ensures that fossil fuel end-users consider the full, societal costs (supply costs plus externalities) when using fossil fuels, improving the allocation of the economy's scarce resources and in line with the 'polluter pays' principle. Driving related externalities (e.g., congestion) are best addressed through various distance-based charging systems; however, until such systems are comprehensively implemented, fuel taxes remain a valid (albeit blunt) second-best instrument (see the Transportation sector for more).

20. The distributional impacts of a €100 per tonne carbon price are small considering extensive indexation in Belgium (Figure 8). The current system for wage and social benefit indexation automatically protects the average household that uses electricity and/or natural gas for heating since higher energy taxes increase inflation.[18] Ignoring the impact of indexation, the loss in purchasing power of poorer households is slightly higher than that of wealthier households (1.8 percent of total consumption vs. 1.5 percent under a €100 per ton carbon tax) and higher for rural vs. urban households across all income deciles.

Figure 8. Belgium: Distributional Impacts of a €100 per Ton Carbon Tax



Source: IMF staff estimates.

Note: Firms would receive an income tax deduction for their increase in input costs, which would result in a 25 percent (i.e., the Belgium CIT rate) lower change in post-tax costs.

21. Revenue could be recycled through targeted cash transfers to vulnerable households to increase acceptability and reductions in labor and/or corporate income taxes to increase productivity. Setting aside the impact of indexation, around 25 percent of carbon pricing revenue is

[18] For example, indexation compensated for roughly half of the 2021-22 increase in energy prices for the lowest two income deciles and almost fully for those in the top half of the income distribution (Capeau et al 2022).

needed to fully compensate households in the lower four income deciles, leaving around 0.6 percent of GDP in revenue to allocate for other objectives, such as reducing income taxes (Figure 8). Energy intensive firms would see a 1–2 percent increase in input costs due to higher electricity prices and could be supported through reductions in the corporate income tax, investments in productive public infrastructure and R&D, and/or rebates based on output,[19] rather than energy inputs, to maintain incentives for emissions-intensity reductions. Support to vulnerable households should be provided through income-based measures (e.g., cash transfers) and phased out as total income (labor and capital income) or wealth increases. Providing income-based support preserves price signals and allows households to make optimal budget allocation decisions for energy versus other uses. Phasing out support avoids reinforcing the unemployment trap where households lose all social benefits once income crosses a specific threshold; instead, the support would be gradually reduced as income grows. Support should not be conditional on household or firm energy expenditure, as this effectively subsidizes energy inefficiency and increases the costs of investing in emissions (and energy) reductions since doing so would mean losing a portion of benefits. More detail on the design of social protection support is outside of the scope of this report, but could be assessed in subsequent Article IVs or capacity development.

22. It is recommended that a carbon tax for non-ETS sectors be phased in through the excise regime, prior to the planned EU-wide ETS for buildings and transportation, and reaching €100 per tonne by 2030. Also, a price floor for ETS sectors would provide greater certainty for investors and help minimize abatement costs across the economy.

- **There are several benefits to introducing domestic carbon pricing for non-ETS sectors prior to the planned EU-wide ETS (proposed to be introduced in 2027).** These include: (i) non-ETS emissions reductions are needed immediately to meet Belgium's ESR.[20] This would help avoid rapid and more costly decarbonization that may be needed if transportation and building emissions reductions are delayed, and support energy security through reducing fossil fuel use (as well as, avoid financial penalties associated with not meeting annual targets, which has previously created politically difficult arrangements among regional and federal governments); (ii) final design decisions for the EU-wide ETS for buildings and transport are pending, increasing the riskiness of investments in the needed clean technology, such as heat pumps and electric vehicles. Introducing a domestic carbon price alleviates uncertainty, especially if the carbon price path is announced in advance and will subsequently act as a price floor for the future EU-wide ETS (roughly following the approach taken by Germany); (iii) competitiveness and leakage concerns are less pronounced for transportation and buildings (since households and non-industrial firms are not likely to move homes and economic activity across borders due to the tax), meaning that pricing coordination across countries (which will be achieved through the future EU-wide ETS) is not needed; and (iv) the expected decline in

[19] Rebates based on output would need to be phased out as CBAM is phased in to ensure WTO compatibility.

[20] Medium-term emissions responses can be significantly greater than short-term responses for transportation and buildings because, for example, in the medium-term, households can purchase more energy-efficient homes and vehicles and closer to working locations, while short-term responses are more on the margin (i.e., driving less).

international energy prices provides an opportunity to phase-in carbon pricing without increasing post-tax prices.

- **The carbon price should progressively increase to around €100 per tonne by 2030**. This would mirror levels in other countries (Table 2), promote significant emissions reductions (Table 3), and align with the global price needed to achieve warming targets. The price path should be announced in advance, with small annual increases (e.g., €10 per tonne each year) and be adjusted for inflation to maintain its real value.
- **The price should be phased in through introducing a carbon tax element to the existing excise regime.** This approach, as compared to an ETS: (i) would avoid volatility in carbon price levels, in line with Belgian's intention to re-balance from the VAT to excise for natural gas and electricity; (ii) build off the existing excise duty regime and, therefore, could be introduced with a minimal administrative burden and within the federal government's competencies; (iii) be compatible with the EU ETS for buildings and transport once it is introduced and act as a domestic price floor; and (iv) avoids leakage that would be caused by regional mitigation policies and a national ETS (leakage would materialize through lower ETS prices), allowing the regions to effectively maintain their building- and transportation-related competencies and for regional policies to reinforce the cost-effective mitigation promoted by the carbon tax.
- **The tax could be extended to non-carbon GHG emissions (e.g., methane)** if administrative, compliance and political costs can be managed. This would allow abatement costs across GHGs to be equalized and promote cost-effective mitigation. The agricultural sector would see the largest impact (since it is the primary source of non-CO_2 GHGs) and competitiveness concerns would need to be addressed through revenue recycling. Proxy taxes could be used in the medium-term to address administrative and compliance barriers (see Parry et al. 2022b for design considerations).
- **The authorities could use a portion of carbon tax revenues to compensate vulnerable households** through income-based support that is phased out as total income or wealth increases.
- **The authorities should also consider a price floor for ETS sectors** (i.e., power and industry) with the level aligned with the carbon tax for non-ETS sectors. This would provide more abatement cost certainty, promoting investment and equalizing abatement costs across the economy (i.e., cost-efficient, economy-wide mitigation). Revenues generated from industry could be recycled to protect against competitiveness concerns. The price floor could be applied as a surcharge, resembling the U.K. Carbon Price Floor, which imposes a national level variable tax (set for three years in advance) on power sector emissions equal to the difference between an exogenous target price and the projected EU ETS price (Hirst and Keep 2018). The Netherlands is implementing a similar scheme for emissions from the power, but at price floor levels that are likely below the EU ETS level and, therefore, will not be binding.

23. Further, Belgium should promote dialogue at the EU level to strengthen the EU's decarbonization policy framework and promote synergies across countries. Ideally, the EU would have a single carbon price across all sectors as this would remove gaps in the marginal

abatement costs among sectors and help cut aggregate emissions in an economically efficient way. Suggestions on ways to strengthen EU-wide policies are:

- **Extend the EU ETS so that aggregate emissions from power**, industry, transport, and buildings are subject to one aggregate cap with a common emissions price across all sectors. This would lead to a more cost-effective balance of emissions reductions across sectors, but would require compensation for lower-income member states with relatively less stringent targets under the current effort-sharing mechanism. Including agriculture emissions would increase economic efficiency but may be administratively infeasible in the near-term.
- **Extend the ability of member states to re-allocate a greater share of emissions reductions from the transport/buildings sectors to the power/industry sectors.** This would lower mitigation costs at the national level, given the much higher cost of incremental abatement in transport and buildings. Such a re-allocation is limited under EU burden sharing rules.
- **Extend the ability to trade ESR quotas between states**, allowing states with emissions reductions in excess of their quota to trade with states not meeting their quota. This would promote cost-efficiencies. A political agreement to do so was reached in late November but details are not yet clear.
- **Establish an exogenous and escalating price floor for both EU ETSs.**[21] Besides providing a critical signal for ensuring that new investment is efficiently allocated to clean technologies, this reform would also allow overlapping measures at the member state level to lower emissions at the EU level (under a pure EU cap these measures only lower allowance prices without affecting EU emissions).

D. Reinforcing Carbon Pricing with Feebates and Other Sectoral Policies

24. Achieving mitigation targets with carbon pricing is likely to require high prices, especially in the transportation and building sectors, which may be politically challenging. Therefore, there is a balance to be struck between economy-wide pricing measures and reinforcing instruments at the sectoral level, which are not as efficient but can have a key role in reducing emissions while avoiding a significant increase in energy prices. Sectoral instruments should be designed flexibly, allowing firms and households to choose responses that minimize costs for a given emissions reduction and (ideally) be technology neutral. Reinforcing instruments can imply differing implicit carbon prices across sectors but can be appropriate as countries move to decarbonize sectors like transport and buildings that are less responsive to carbon pricing and meet sectoral or technology-specific targets (like Belgium's renewable energy share commitment under the EU Renewable Energy Directive).

[21] There is some uncertainty over the legality of an EU level price floor if it is viewed as a fiscal (general revenue-raising) instrument rather than an instrument to support an environmental regulation. Use of allowance auction revenue to support the low carbon transition may help to address this issue (e.g., Cosbey et al 2019).

25. Feebates—revenue neutral tax-subsidy schemes—are a relatively efficient reinforcing policy. Feebates are the fiscal analogue of more traditional emissions-rate regulations and involve financing subsidies to relatively clean activities while taxing relatively dirty ones. They are novel instrument as they would be applied by finance ministries; reinforcing instruments have largely taken the form of regulations to date, which are the more natural instrument when climate policy is under the purview of environmental ministries. Feebates are potentially more flexible and cost effective than emissions-rate regulations given that the latter are only fully cost-effective with extensive credit trading provisions across firms and time. At the same time, feebates can naturally complement and reinforce (rather than substitute for) existing regulations, for example, by rewarding firms for going beyond standards. Also, feebates do not raise average prices for consumers or costs for firms, making them less politically challenging. The discussion below illustrates the use of feebates for transportation, power, buildings, industry, and agricultural sectors, as well as other sector level policies.

Power Generation

26. Decarbonizing electricity production is key to realizing decarbonization. Industry, transportation, and buildings need to electrify several activities, along with improving energy efficiency, in order to reduce fossil fuel use. This switch will significantly increase electricity demand, but will only result in the needed emissions reductions if the emissions-intensity of electricity is low. Analysis shows that there is significant renewable potential in Belgium—for example, there is enough potential onshore wind and rooftop solar capacity to more than double existing electricity demand (EnergyVille 2021)—but improvements to the fiscal and regulatory framework are needed to cost-effectively realize benefits.

27. Belgium currently has a relatively low-carbon electricity grid, but the emissions impact of Belgium's nuclear power phase out needs to be managed. Nuclear power currently makes up 45 percent of generation and provides the largest 'baseload' electricity source (i.e., sources that can reliably provide electricity at any point in time). The nuclear phase-out was legislated in 2003 and is expected to be complete by 2035.[22] Belgium's current policy to ensure enough adequate baseload capacity is the Capacity Remuneration Mechanism (CRM), which provides payments for future capacity guarantees through auctions. The first CRM auction (in 2021) awarded 4.4 GW for delivery in 2025, with 3.6 GW from natural gas and the rest primarily from co-generation and demand-side response. Annual CRM auctions are planned to ensure capacity one and four years ahead. There is a derating factor, which effectively requires lower auction prices for energy sources with less reliability (i.e., renewables). Also, the federal government is undertaking an auction to develop 3.15 to 3.5 GW in new offshore wind generation in Princess Elisabeth Island, and is increasing interconnections to import clean electricity from Norway and Denmark.

[22] The first reactor (17 percent of nuclear capacity) was decommissioned in 2022, and others are planned for 2023, 2025, and 2035.

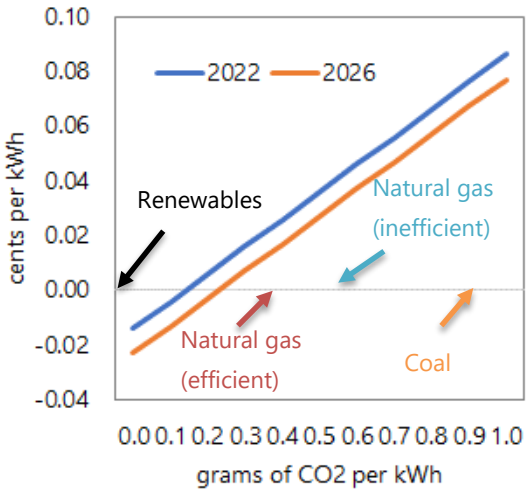
28. A feebate reinforces incentives for shifting to a cleaner power generation mix without a first-order tax burden—that is, a tax on remaining emissions—for the average electricity producer and consumer.[23] Under a feebate scheme, generators could be subject to a fee given by:

{CO_2 price} × {CO_2/kWh – industry-wide average CO_2/kWh} × {electricity generation}

29. A feebate in the power sector could be practically implemented in Belgium, and could reinforce a price floor on the EU ETS. The scheme could build off existing procedures for monitoring power company emissions under the EU ETS. Nuclear would be exempt given the planned phase-out, and a smoothing mechanism used to determine the industry-wide average emissions-intensity (e.g., a five-year average) to help promote certainty and avoid jumps in subsidies for renewables as nuclear power is decommissioned. For the feebate to be within the federal government's competencies, it could be applied through refundable credits and taxes in the corporate or personal income (PIT) tax regime, which may require additional information sharing between the tax authority and electricity grid companies, or (ideally) as a direct excise/subsidy scheme.[24] A feebate interacts well with the CRM as incentives for capacity would be maintained through the CRM's auction mechanism and derating factors, while the feebate would allow a more market-based, efficient policy to promote low-carbon electricity within the CRM framework.

30. For illustration, a feebate with price €100 per tonne would have applied a fee equivalent to 3 cents/kWh for natural gas and a subsidy of 1.5 cents/kWh for renewables in 2022 (Figure 9). Fees on fossil fuel generation would decrease as nuclear is phased-out since the average emissions-intensity of electricity would increase. To avoid a declining fee on fossil-fuel based generation, the pivot point (i.e., the emissions-intensity that results in no subsidy or fee) could be set exogenously to decline at a rate that would allow Belgium to meet its renewable energy targets.[25] The feebate also promotes more energy efficient natural gas technologies, hydrogen blending with natural gas, and carbon capture, and provides a strong disincentive against coal power generation. It could be applied to

Figure 9. Belgium: Illustrative Feebate for Power Sector



Source: IMF staff estimates.

[23] The feebate would impact electricity prices at times when the marginal supply is powered by natural gas, but lower prices at times when renewables do so.

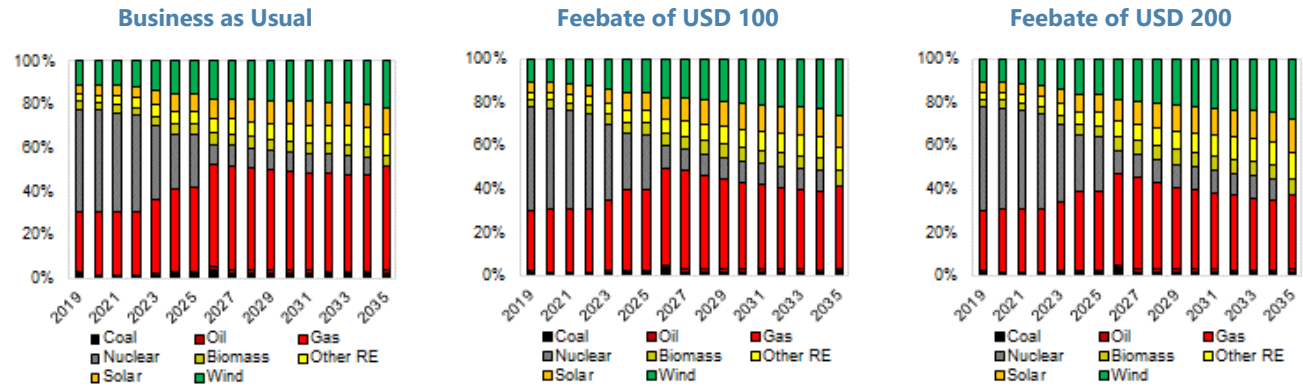
[24] The PIT-related feebate would apply to production and not purchases. For example, a household with a rooftop solar panel would receive X per kWh produced.

[25] Additional analysis is needed to calibrate the specific price level and decline rate.

residential renewable energy production that is connected to the grid; heating using renewables (for instance, rooftop solar PV to heat water) would require a separate policy.

31. Analysis shows that feebates can significantly reduce the emissions-intensity of electricity as compared to the business-as-usual scenario (Figure 10). Switching towards renewables needs to be combined with electricity grid management, demand-side response, and energy storage measures to reduce concerns around intermittency. Importantly, while a feebate would reduce national emissions, they will not (fully) reduce EU-wide emissions if the MSR is not operating since falling emissions in Belgium will reduce the ETS price and result in leakage to other countries and to Belgium's industrial sector.

Figure 10. Belgium: Electricity Mix under Various Scenarios



Source: IMF staff estimates using CPAT.

32. The primary existing clean energy promotion scheme ('Green Certificate Scheme') should be reconsidered.[26] The Green Certificate Scheme effectively results in electricity consumers paying green electricity producers for certificates, which had a cost of €2.4 billion in 2020, and has contributed to growing debt levels for Elia, Belgium's electricity transmission system operator (Cornille and others 2021). The scheme is regressive since wealthier households have a large share of rooftop solar and, thus, residential renewable electricity production; includes several arbitrary design parameters (such as the minimum level of support); and is partly financed through surcharges on electricity bills, which contributes to a higher price of electricity relative to fossil fuels. Feebates could replace the existing scheme to improve the efficiency of incentivizes, while not increasing prices. See Cornille and others 2021 for more analysis on the Green Certificate Scheme.

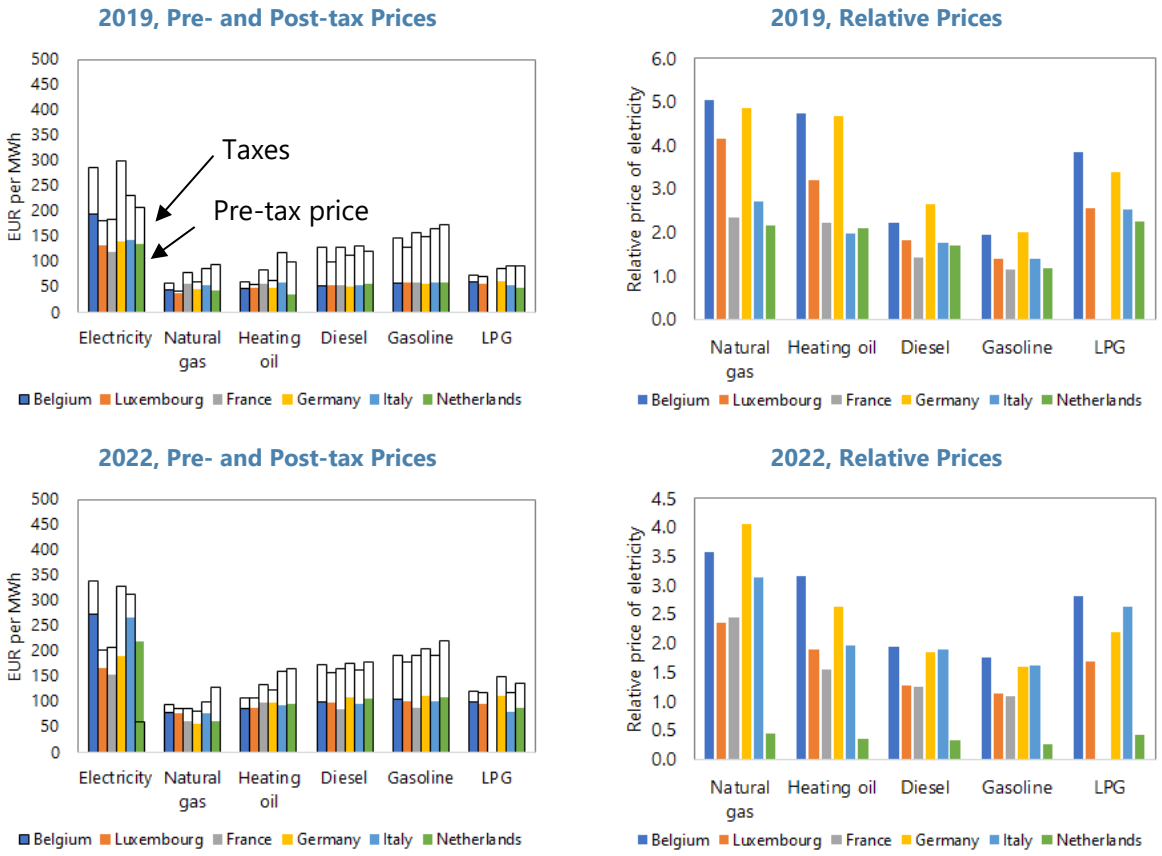
33. Reducing fees and levies on electricity would promote electrification by lowering the price of electricity relative to fossil fuels. The price of electricity relative to heating oil, natural gas,

[26] The current scheme works as follows: green power generators receive certificates as they produce power, energy suppliers purchase enough certificates from generators to meet a quota expressed as a percentage of total electricity supply (there is a minimum certificate price), and suppliers can pass on the cost of certificates to consumers.

The transmission system operator (Elia) is obliged to purchase any surplus certificates at the minimum price, which is reported to result in significant debt for Elia that will eventually be paid for by taxpayers and/or electricity consumers. Certificates are not tradable across regions and each region has its own policy design.

diesel and gasoline is generally higher in Belgium than it is in neighboring countries (Figure 11). The high electricity price reduces incentives to switch from polluting vehicles and heating systems (as well as industrial processes) to electricity.[27] The energy portion of electricity costs (i.e., the cost

Figure 11. Belgium: Relative Price of Electricity



Source: IMF Staff estimates.
Note: assumes natural gas and electricity prices for consumption of 20 to 200 GJ and 2.5 to 5 MWh, respectively. The relative price of electricity is calculated as electricity divided by the other commodity's price.

excluding all fees, levies, and taxes) is on par with that in France, Germany, and the Netherlands (CREG 2021, Deloitte 2022) and, therefore, differences come from charges to recover network costs (such as transmission and distribution), fees, levies, taxes, and (potentially) market power. The full set of electricity charges is not entirely clear, but they do include levies to pay for various programs that are not directly related to the delivery of electricity to end-consumers, such as charges to fund a heating premium, green certificates, and decommissioning of the Mol-Dessel nuclear site (Deloitte 2022). Belgium should gradually remove charges that do not directly relate to delivering electricity to end-users and, instead, finance those measures through the general budget as this will promote

[27] For example, the discounted purchase and electricity cost of a €30,000 electric vehicle would decline by 4.5 percent (9 percent for a €15,000 electric vehicle) if the electricity price declined from €0.29 to €0.19 per kWh.

climate objectives, as well as economic efficiency by better aligning electricity prices with their generation costs.[28]

Industry

34. Industrial emissions contribute 35 percent to Belgium's total emissions, and there are important exclusions from the ETS. The main emitting sub-sectors are chemicals, refining of oil and coke, and manufacture of non-metallic minerals and metals. Emissions are roughly split between direct fuel combustion and industrial processes.[29] About 20 percent of industrial emissions are outside of the ETS due to emissions from installations below the ETS threshold of 25,000 tonnes of CO_2 per year and emissions from biomass being excluded from the ETS. Most excluded emissions occur in the chemical and food sectors and are currently not covered by domestic mitigation policies, with the exemption of voluntary agreements at the regional level (Climact 2018).

35. Feebates could reinforce incentives for cleaner production processes in carbon-intensive industries. The scheme could be like a policy being introduced in the Netherlands and a tradable emissions rate standard in Canada. In this case, firms within an industry would be subject to a fee given by:

$$\{CO_2 \text{ price}\} \times \{CO_2/\text{output} - \text{industry-wide average } CO_2/\text{output}\} \times \{\text{firm output}\}$$

36. The feebate, which would be applied to emissions from fuel combustion and direct and process emissions, avoids a first-order burden on the average producer as they pay no charge on their remaining emissions. This helps to alleviate concerns about competitiveness and leakage compared with a pricing scheme that charges for remaining emissions, but is less efficient in reducing emissions because it does not result in a decrease in output. Again, the scheme could build off existing procedures for monitoring firms' direct emissions under the EU ETS, and operate in tandem with voluntary agreements, which are the primary existing domestic policy to promote emissions reduction in the industrial sector.[30] The pivot-point (i.e., industry-wide average emissions-intensity) could be set exogenously based on future projected emissions-intensity if there are concerns around market power, where a few firms have a significant influence on the industry-wide emissions-intensity. The pivot-point could be unique to each sub-sector within industry (i.e., steel) with permit trading across sub-sectors, as this would avoid promoting relatively clean industrial sub-sectors (which could lead to leakage of relatively dirty sectors abroad) while promoting cost-effectiveness.

[28] It is important that such measures are coupled with enhanced policies to promote renewable energy (discussed above) and energy efficiency (a subset of which are discussed in the subsequent section on buildings) to avoid promoting polluting electricity use.

[29] CO_2 is released as a by-product from chemical processes that produce various industrial outputs. For example, a key part of the ammonia (NH_3) production process is to decompose methane (CH_4) into carbon and hydrogen. The carbon then binds with oxygen and is released as CO_2.

[30] Agreements cover the bulk of sectoral emissions and require firms to take actions to reduce energy efficiency and/or emissions reduction, in exchange for tax reductions (IEA 2022). The details of these agreements are not available, but they are reported to have been effective.

Buildings

37. Buildings make up 21 percent of total emissions.[31] Residential buildings are the primary source of building emissions (75 percent), and largely use natural gas and oil for energy. The energy share from oil far exceeds the EU average (32 percent of total energy consumption in Belgium vs. 21 percent in the EU), while renewables (8 vs. 20 percent) and electricity (20 vs. 25 percent) lag. Most energy is used for space and water heating (83 percent), with the remainder for lighting and electrical appliances. Commercial buildings use natural gas for 70 percent of their energy (Climact 2018). Buildings also are the main source of pollutants with local health impacts, such as PM2.5, due to the large share of biomass burned for heating during winter months (7 percent of total household heating in 2020) (Climact 2018, FOD Economie 2022).

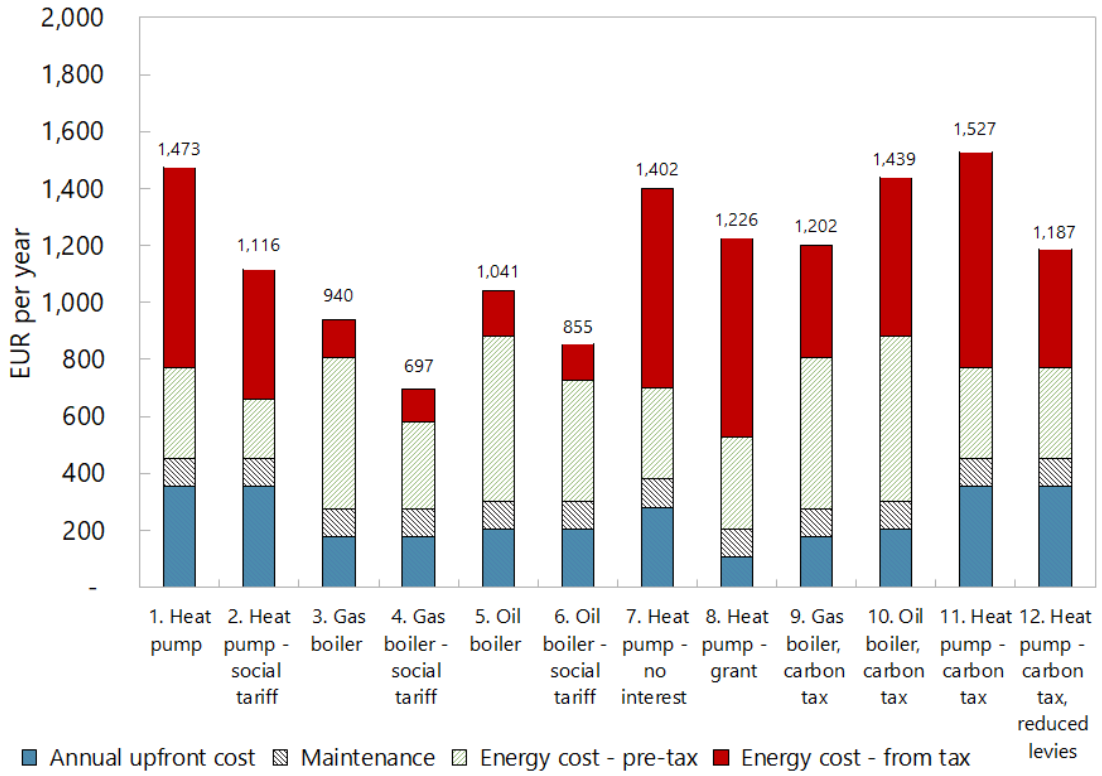
38. Building energy performance, age, and heating methods vary across regions and income levels, suggesting that mitigation policies could have quite heterogenous impacts. Belgium's building stock is relatively old with 80 percent of constructions occurring prior to energy standards across Belgium and 94 percent in Brussels (Climact 2018). Poorer households have worse insulation on all key dimensions, including windows, roofs, and walls, while apartments have much better energy performance, as measured in energy used per area, thanks to their more insulated structure. This results in Brussels having a relatively more energy efficient housing stock due to its large share of apartments, although recently purchased dwellings have similar energy efficiency scores across regions (Reusens et al 2022). The heating source varies significantly, with 16, 24, and 50 percent of houses heated using an oil boiler in Brussels, Flanders, and Wallonia, respectively, partly due to the low share of houses connected to the natural gas grid in Wallonia. Household consumption surveys support these results—for example, households in the lowest income quartile spent roughly eight percent of total consumption on natural gas, heating oil, and electricity, compared to 3.6 percent for the highest quartile in 2018. Heating oil spending is far higher in Wallonia than other regions for all income quartiles.

39. The current policy mix creates disincentives to invest in low-carbon heating; a carbon tax combined with reduced electricity fees and transitioning from a social tariff to income-based support would close the cost gap. Figure 12, which shows the annualized cost of heating across technologies over a 20 year period, illustrates that heat pumps are not cost competitive (column 1) compared to natural gas and oil boilers (columns 3 and 5), assuming pre-crisis price levels.[32] The social tariff significantly reduces costs for electricity, natural gas, and oil (columns 2, 4, 6), while a carbon tax raises all-in natural gas heating costs by about 28 percent (column 9), 38 percent for oil (column 10), and 4 percent for a heat pump (column 11). Removing fees and levies charged on electricity consumption (outside of those covering network costs) reduces heat pump

[31] Building emissions only capture fossil fuel used directly to heat and cool non-industrial buildings and for appliance uses. It does not include emissions from electricity generation (i.e., indirect) or the industrial sector.

[32] Households that are not connected to the natural gas grid (45 percent of households) generally choose between heat pumps and oil boilers, while others choose between heat pumps and natural gas boilers. All systems could be combined with a rooftop solar system to provide additional, low-carbon heating.

Figure 12. Belgium: Illustrative Average Annual Cost of Heating Options



Source: IMF Staff estimates.

Note: assumes air-source heat pumps (95 percent of existing heat pumps in Belgium are air-source), a discount rate of 7 percent, and interest rate of 4.5 percent. The grant is assumed to cover 70 percent of equipment and installation costs. The calculation ignores replacement costs for an existing boiler and assumes that all heating sources last for 20 years. A heat pump likely needs to be combined with another heating source (e.g., solar PV or a fossil fuel boiler) when temperatures drop, but this is not modelled as there are additional incentives provided for solar PV. Results are sensitive to fuel price assumptions—prices are assumed to be at pre-crisis levels and are EUR 0.054 and 0.034 per kWh (natural gas; without and with social tariff, respectively), EUR 0.060 and 0.045 per kWh (heating oil), and EUR 0.290 and 0.189 per kWh (electricity).

costs by 20 percent (column 12). An efficient pricing system of a carbon tax, no social tariff, and network fees and levies in line with neighboring countries would align costs of fossil fuel and electricity-based heating. Revenue gains could be recycled to support impacted households or subsidize low-carbon heating. This would be especially important to help households transition from heating oil to heat pumps due to the large cost increase for heating oil and the possibility that households would switch to biomass use, which has much worse local health impacts. Grants and no-interest loans could help reduce costs (columns 7 and 8). It should be noted that the social tariff makes natural gas heating significantly cheaper than heat pumps, even if the entire capital cost of a heat pump is paid for by government.

40. The current renovation rate of 1 percent annually needs to increase 2.5 to 3 percent to meet emissions targets, and deep renovations are needed (Climact 2021). Actions through existing buildings are needed given the very gradual turnover of the building stock and as

requirements for new builds are quite strict. Energy efficiency improvements have been found to significantly influence housing values, indicating that homeowners in general have an incentive to renovate existing or buy new energy efficient households (Reusens and others 2022). However, building refurbishment may still be held back by liquidity constraints (especially for lower income households), cost-benefit mismatches between owners and renters,[33] unawareness or uncertainty of potential energy savings from upgrades, lack of consistency in the criteria for energy performance certificates (EPCs) across regions, and lack of knowledge of long-term EPC requirements. It is unclear whether recently introduced regional policies, which appear to target liquidity and income constraints (through concessionary loans and grants), will promote the needed renovation; this needs to be monitored as well as supply constraints in the construction sector, including labor.

41. Feebates could be used to encourage the phase out of fossil fuel-based space heating, use of more energy-efficient appliances, and building renovations. For household heating, a feebate could take the form of a carbon tax on heating fuels and subsidies for electric or clean-fuel heating systems and energy-efficiency improving renovations. Sales of appliances, such as refrigerators, air conditioners, washing machines, could incur a fee equal to:

$$\{CO_2 \text{ price}\} \times \{CO_2 \text{ per unit of energy}\} \times \{\text{energy consumption per unit} - \text{industry-wide energy consumption per unit}\} \times \{\text{number of units}\}$$

For refrigerators, for example, the energy consumption per unit would be kWh/cubic foot cooled (and the number of units would be cubic feet).

42. Property taxes could be linked to energy use per square meter of a building or EPC scores to mimic a feebate, but such a policy would need to be studied in detail to ensure its efficiency. The cost to administer the property tax would increase, as reported energy efficiency or EPCs would need to be audited, and the effectiveness of a tax based on the EPC score would depend on the correlation between EPC scores and CO_2 emissions.[34] It would also be a regressive policy, as poorer households generally live in dwellings with worse insulation (Cornille et al 2021). Federal policy options to implement feebates in this area are limited due to a lack of information and competency.

Transportation

43. Road transportation emissions mainly come from passenger vehicles (75 percent), with road freight making up most of the remainder. Car ownership is similar to the EU average and neighboring countries at around one car for every two people. The share of EVs and plug-in hybrids in new car sales is relatively low (5 percent in 2021), and growth has not accelerated at the pace of neighboring countries. However, the fuel efficiency of new cars is below the EU average at the national and regional level (Figure 13), with company cars driving recent reductions. Statistics

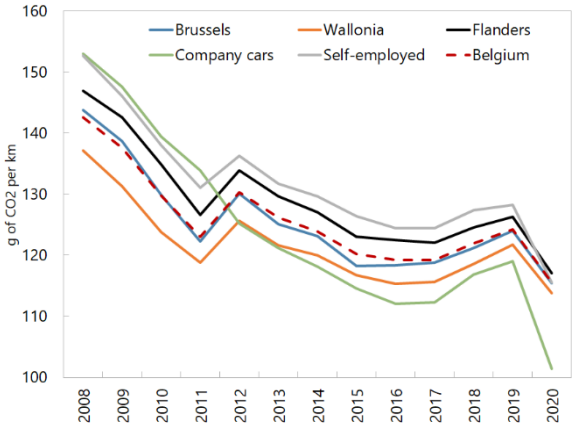
[33] See for example Arregui et al (2020). One-third of residential builders are not owner-occupied, and owners cannot easily passthrough the financial benefits of green investments to renters due to rent indexation.

[34] For example, the energy conversion factor to determine the efficiency of heat pumps is expected to currently be too low, creating a bias against heat pumps when determining the EPC.

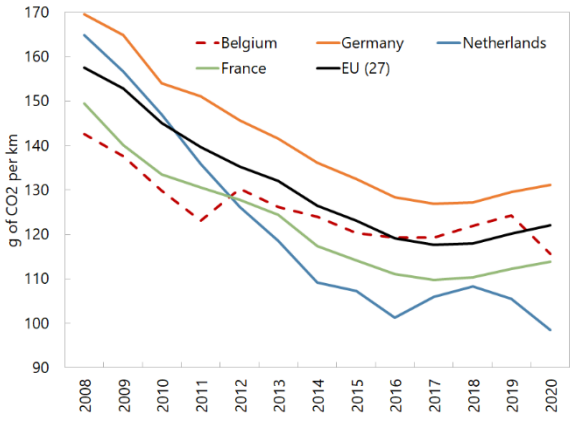
indicate modest availability of EV charging stations relative to other EU countries (8.8 charging points per 100 km of road, ACEA 2022b). Belgian lags countries with ambitious EV plans and higher EV uptake, such as Germany (26 per 100 km) and the Netherlands (64 per 100 km). Less than 10 percent of charging stations in Belgium are 'fast' compared to much higher rates in other countries (ACEA 2022b).

Figure 13. Belgium: CO_2 Emissions of New Cars

By Region and Car Purchaser



Belgium Compared to Other Countries



Source: Federation Belge et Luxembourgeoise de L'Automobile et du Cycle and Eurostat.

44. There are registration and annual circulation taxes applied at the regional level, as well as other policies to reduce transportation emissions. Such policies are especially important since decarbonizing road transportation through carbon pricing alone is difficult due to the political resistance to higher road fuel prices. The design of registration and annual circulation taxes differ by region, with the Flanders and Walloon registration taxes varying based on the vehicle's CO2 emissions-rate and Brussels considering such a policy (IEA 2022). There is also a federal income tax credit of 15 percent of the purchase price up to €5,150 for electric vehicles purchased by individuals available until 2024, and a nationwide scheme that charges heavy commercial vehicles per kilometer travelled. Each region has its own incentive regime for low-emitting vehicles (such as Low Emissions Zones, which prohibit high emitting vehicles from driving in specific areas), as well as requirements to green the public transport and government vehicles stock.

45. The existing tax system for transportation has limited effectiveness for two reasons. First, expressing the registration and annual circulation tax on a lifetime basis, Flanders, Brussels, and Wallonia apply only modest taxes on high emission vehicles, and the relative price of low-emitting, non-electric vehicles is not decreased relative to vehicles with average levels of emissions in Brussels or Wallonia (Figure 14). Second, as the EU emission rate standards are applied to fleetwide average emissions, any shift in demand to low-emission vehicles created by the tax system might be offset by less efforts in reducing emission rates of other vehicles in the fleet.

46. A feebate applied to vehicles, which are paid by consumers, would address both problems. A feebate provides a sliding scale of fees on vehicles with above average emission rates and a sliding scale of rebates for vehicles with below average emission rates. Specifically, vehicle sales would be subject to an annual fee given by:

{CO_2 price} × {the vehicle's CO_2/km – the industry average CO_2/km} × {the average lifetime km driven per vehicle}

47. For illustration, a feebate with price of €400 per tonne of CO_2 would provide the same EV subsidy as at present, but apply a tax of €3,000 to a vehicle with 200 g CO2/km (an increase of around €1,000 for Brussels and Wallonia). Importantly, it would incentivize purchase of low emissions vehicles that are not electric, which are currently not subsidized in Belgium, and could replace the company car regime—the federal government could introduce it unilaterally through personal income tax credits,[35] but ideally would work with regions to harmonize vehicle taxes/subsidy systems and provide any necessary financing. Subsidies for EVs would decline over time as the average fleet emission rate declines, which is appropriate as the cost differential between clean vehicles and their gasoline/diesel counterparts narrows over time (e.g., with improvements in EV battery technology). And manufacturers would be penalized for any increase in emissions for the rest of their fleet in response to higher sales shares for EVs.

Other attractions of feebates include as follows:

- Feebates automatically maintain revenue neutrality despite the progressive decarbonization of the vehicle fleet because the average fleet emission rate in the feebate formula updates; and
- Feebates do not require new data or administrative capacity relative to the existing emission rate program.

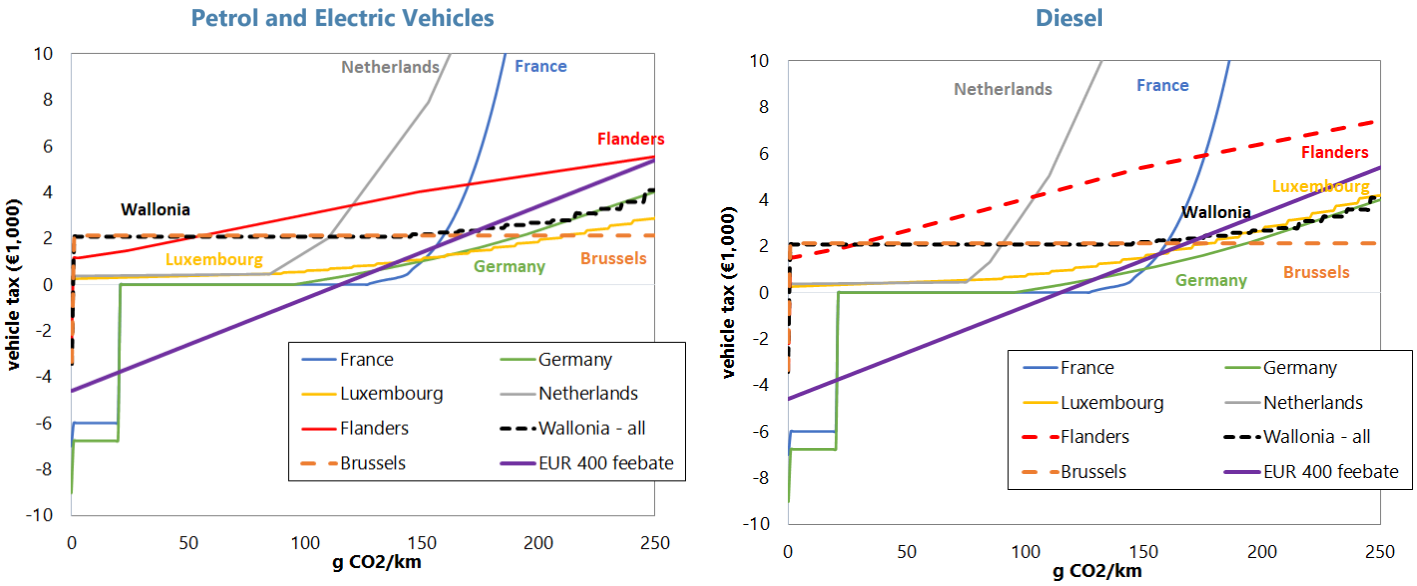
48. The generous incentivizes for company cars has been made more environmentally friendly, but further reform is needed, and ideally, the regime would be replaced with a feebate policy. The tax treatment of company cars (i.e., cars purchased by companies and available to employees for private use) creates a significant incentive for employees to be compensated with a car, rather than in cash.[36] Recent reforms include restricting company car eligibility to EVs by 2026 and the introduction of the mobility budget, but it is reported that the take-up rate of the mobility

[35] Credits would be preferred to deductions since deductions disproportionately favor those with higher marginal tax rates (i.e., wealthier households, IMF 2021). Credits would need to be refundable to incentive households with low-income tax payable.

[36] The incentive materializes through company cars effectively not subject to VAT (since businesses can reclaim VAT on inputs), costs are tax deductible for the company, and provides an income tax advantage for the recipient since in-kind benefits are not subject to social security contributions. The portion of the company car value that is subject to personal income taxation as in-kind benefits depends on the vehicle's carbon-intensity and will progressively shift towards limiting tax deductibility to only electric vehicles.

budget is low.[37] Ideally, the company car regime would be eliminated as it is regressive (Traversa and Valenduc, 2020), contributes to congestion (around 12 percent of the total vehicle fleet), and is fiscally costly (estimated at around 1 percent of GDP).

Figure 14. Belgium: CO_2-Based Components of Vehicle Taxes



Source: ACEA 2022a, IMF Staff estimates.
Notes: assumes an engine strength of 1,500 cc (average for new Belgian vehicles in 2018, ICCT 2019) and vehicles meet Euronorm 6 standards. Annual Circulation Fees are discounted at 7 percent over 13 years.

49. Broader reforms using other fiscal instruments could address other transportation externalities in the future. Transportation externalities, such as congestion, road damage, and accidents, are best addressed through distance-, location- and time-based (i.e., congestion) charges, rather than fuel taxes. The existing heavy duty truck distance-based charge is an example of pricing road damage through a distance-based mechanism. The importance of moving towards such a tax system for transportation grows with EV penetration as EVs contribute to external costs but driving is not discouraged through road fuel taxes (nor are fiscal revenues gained). Moreover, the administrative feasibility of such charges is increasing with technological improvements, such as improved and lower cost global positioning system (GPS) tools. Such policies, at least with respect to congestion,[38] would be within regional competencies but should be coupled with reductions in road fuel taxes (and potentially vehicle registration and annual circulation fees). Moving towards more efficient distance and time-based pricing would, therefore, result in a revenue shift from

[37] The mobility budget allows employers to provide workers with in-kind, tax preferred benefits for low-emissions company cars and other mobility options (e.g., bicycles) and cash for public transport and accommodation near the place of employment, The mobility budget is a minimum of € 3,000 per year and maximum of the lesser of one fifth of gross remuneration and €16,000 per year.

[38] See Hoornaert and Steenbergen 2019 for a quantification of distance and time-based charges in Belgium.

federal to regional governments but still provide the general government with a robust source of revenue from transportation as the base of traditional fuel tax systems is eroded.[39]

E. Conclusion and Summary of Policy Recommendations

50. Carbon pricing coupled with reinforcing sectoral policies would promote emissions reductions at limited economic and administrative costs. Carbon pricing should be the centerpiece of Belgium's the decarbonization policy as it is most efficient and can be easily implemented through the existing excise regime. Price-based, sectoral policies, such as feebates, provide a compliment when exceedingly high carbon prices are needed to meet emissions reduction targets (e.g., in the buildings and transportation sector) or significant non-climate considerations (e.g., nuclear phase-out and industrial competitiveness concerns).

51. Several policies are recommended, with carbon pricing in non-ETS sectors and a price floor for the existing EU ETS ideally prioritized. The full set of recommendations would reduce emissions to at least 20 percent below business-as-usual levels by 2030 (33 percent below 2005 levels) and raise substantial revenue (at least 0.6 percent of GDP) that could be used to support vulnerable households and firms and increase economic productivity.

[39] To more accurately price accident-related externalities, pay-as-you-drive (PAYD) vehicle insurance could be promoted through fiscal incentives at the household or insurance company level. PAYD insurance would work by charging a premium per kilometer travelled, rather than a lump-sum amount, and, therefore, incentivize reductions in driving levels.

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Appendix I. Recent Studies on Climate Mitigation Policies and Other Carbon Taxes in Belgium

Several studies have been published on mitigation policy in Belgium. This annex reviews those by Transport and Mobility Leuven and the National Bank of Belgium (NBB), as well as the National Carbon Pricing Debate of 2018. Additional studies include Climact 2021 and FPS 2019.

A. Transport and Mobility Leuven

1. A study by researchers at Leuven University (Leuven 2022) focuses on carbon pricing for two non-ETS sectors—transportation and buildings. It finds that revising energy taxation to be based on carbon content would reduce transportation and building emissions by 11.3 percent and 14.1 percent, respectively, by 2030 in the context of a reference scenario for a €100 per tonne carbon tax).[1] The tax would raise significant revenues (€2.7 billion by 2030), and revenue could be recycled to improve equity, maintain reduced VAT on electricity, and/or promote economic efficiency, for example, by reducing labor taxes.

2. The study recommends a policy package with a carbon price, revising aligning excise taxes on fuels with the soon-to-be-revised Energy Tax Directive,[2] and recycling revenues through direct income transfers to vulnerable households. Moreover, the study urges that reforms should be introduced as quickly as possible to achieve the necessary emissions reductions in non-ETS sectors, which require long-term investment in clean technologies. The study also suggests progressively introducing the reform as international energy prices fall, as well as ensuring complementarity with other EU, federal, and regional measures.

3. The Leuven study also recommends sectoral-level policies. These include: removing preferential VAT treatment for fertilizer, pesticides, meat, and aviation; a tax on pesticides and fertilizers;[3] phasing out or reduce the reimbursement for commercial diesel; phasing out the preferential tax treatment of company cars and fuel cards; increasing the aviation departure tax; and introducing excises on LPG, compressed natural gas (CNG), and kerosene. The study also states that further work is needed to assess the possibility of increasing the current tax on nuclear energy rents and potentially extending it to other energy sources with high upfront and low operating costs (e.g., renewables), as well as taxation of inland waterway transport.

[1] The study uses the European Model for the Assessment of Income Distribution and Inequality Effects of Economic Policies (EDIP) to assess emissions reductions from carbon pricing and microsimulations based on the 2018 Household Budget Survey to assess distributional impacts.

[2] The ETD update will impact the level and base of tax rates. Tax rates will be tied to a fuel's energy content rather than volume, rates will be adjusted upward to reflect inflation occurring since the initial ETD in 2003, and subsequently be adjusted annually for inflation, and more fuels will be included (such as kerosene for aviation, heavy oil for maritime, and products used in mineralogical processes).

[3] Fertilizers have climate impacts through during production and directly in their use, as they are energy-intensive to produce and increase the release of nitrous oxide (N_20, which is an important greenhouse gas) from soil into the atmosphere when they are used.

B. National Bank of Belgium

4. The National Bank of Belgium (NBB) study (Cornille et al 2021) finds that effective carbon tax rates are currently relatively low for industry and buildings in Belgium, and that tax rates should be partly linked to the carbon content of fuel consumption. The study suggests that the Green Certificate Scheme, which is meant to promote investment in renewables, is likely not cost-effective, and promoting renewable energy should be done through carbon pricing and subsidies on the capital cost of low-carbon, residential technology. Reducing of the price of electricity relative to natural gas, which is partly high due to extensive surcharges for electricity consumers and low natural gas taxes, would support investment in heat pumps. Current support for heat pumps is relatively low, with subsidies for condensing boilers that use natural gas or oil.

5. Extensive incidence analysis is provided in the NBB study. The share of spending on transportation varies by region and income groups, with more spending on transportation in Flanders and Wallonia and by high-income households. Electricity spending is skewed towards low-income households, but there is significant heterogeneity withing income groups and across regions (lower consumption and similar shares across income groups in Brussels). Natural gas and heating oil spending is higher for low-income groups across all regions. High-income households have houses with better insulation, and one study found that this could be due to financial constraints for low-income households (Heylen and Vanderstaeten, 2019). The conclusion of the incidence analysis is that low-income households would benefit from general income support as carbon prices are introduced, as well as subsidies for clean technology, including concessionary access to financing. The study also notes that environmental tax revenues should not be earmarked but rather spent considering the full set of government objectives.

C. National Carbon Pricing Debate

The National Carbon Pricing Debate (Climact 2018) was launched by the federal government in 2017 and provided a comprehensive evaluation of potential carbon pricing options in Belgium.

6. The evaluation concluded that three principles should be followed when introducing carbon pricing: (i) carbon pricing should be revenue neutral, potentially through reducing labor taxes or electricity charges and levies, or with lump-sum transfers, (ii) the pricing policy should send a credible, long-term signal to direct investments and other input choices towards greener options, and (iii) complementary policies are needed to maximize the benefits of carbon pricing and promote further emissions reductions, as well as address barriers (such as information gaps and principle/agent problems).

- *Buildings:* the study noted that carbon pricing is an efficient way to green residential and commercial buildings, although there is a concern that raising taxes on buildings will disproportionately hurt the vulnerable. Taxes are regressive without compensating measures, and the study suggests either lump-sum transfers or energy vouchers to vulnerable citizens. A

secondary option is renovation programs for households, support to SMEs, or lump-sum transfers to every citizen.

- *Transport:* the carbon price should cover all fossil fuels (with the biomass component of fuels subject to taxation using the emission factor equivalent to the associated fuel), with special care given to diesel used for commercial purposes since freight activity is mobile (i.e., subject to leakage and lost economic activity). The study provided two options: (i) including a carbon price on top of the existing excise and limiting the final price of diesel for commercial purposes to that of neighboring countries or (ii) introducing carbon pricing using a 'smart' road pricing system, although this would require time to implement. Other transportation policies (e.g., company cars) should be made consistent with emissions reduction goals.

- *Industry:* non-ETS emissions are 17 percent of total industrial sector emissions—35 and 65 percent are from processes and energy, respectively.[4] The report proposed two options: (i) price all fossil fuel emissions except for those at risk of carbon leakage, for which carbon prices would be limited to the current price difference with neighboring countries, and price process emissions conservatively due to leakage concerns and high abatement costs; and (ii) reform the voluntary agreements of the Walloon and Flemish region to incorporate an explicit carbon price and impose a carbon price on those that do not use the voluntary agreement.

- *Agriculture:* these are some Belgium-specific aspects to consider, including that a relatively large portion of products are trade exposed. Carbon pricing should cover energy-related emissions from non-stationary sources (offroad vehicles and machinery) and use a similar approach for stationary sources (mostly agricultural greenhouses) to that of the non-ETS industry (cap post-tax price levels or implement voluntary agreements). Pricing non-CO2 emissions would be complicated by the difficulty in measuring emissions.

D. Key Modelling Parameters

7. Modelling the emissions trajectory with and without fiscal policies requires several assumptions. The CPAT model is used for this paper and its results are primary dependent on energy price projections (and relative prices across different energy sources), which are driven by international prices and domestic policies; the responsiveness of energy use to prices and income (i.e., elasticities); and energy efficiency improvements from the autonomous technological change. A subset of key assumptions is provided in Table 4 and have been calibrated based on the existing literature and to align model results with that of more complex climate models. Forecasted international energy prices use the average of the IMF's World Economic Outlook and the International Energy Agency's World Energy Outlook (Stated Policies Scenario) and forecasted GDP is sourced from the IMF's WEO.

[4] Specifically, these emissions are from chemicals, food and drinks, textiles, off-road emissions from industry and construction, manufacture of wood products, glass, ceramics, cement, lime, and plaster.

Table 1. Belgium: Key Modelling Parameters						
Energy source	Elasticity with respect to income 1/			Elasticity with respect to price 1, 2/		
	Transport	Residential	Industry	Transport	Residential	Industry
Coal	NA	NA	0.5	NA	NA	-0.2
Natural gas	0.5	0.3	1.0	-0.4	-0.3	-0.4
Gasoline	0.7	NA	0.5	-0.3	-0.4	-0.3
Diesel	0.6	0.5	0.5	-0.2	-0.2	-0.6
Electricity	1.2	0.8	0.8	-0.1	-0.2	-0.2
1/ elasticities are interpreted as the percent change in fuel use that corresponds with a percent change in prices or income. 2/ there are separate cross-price elasticities.						