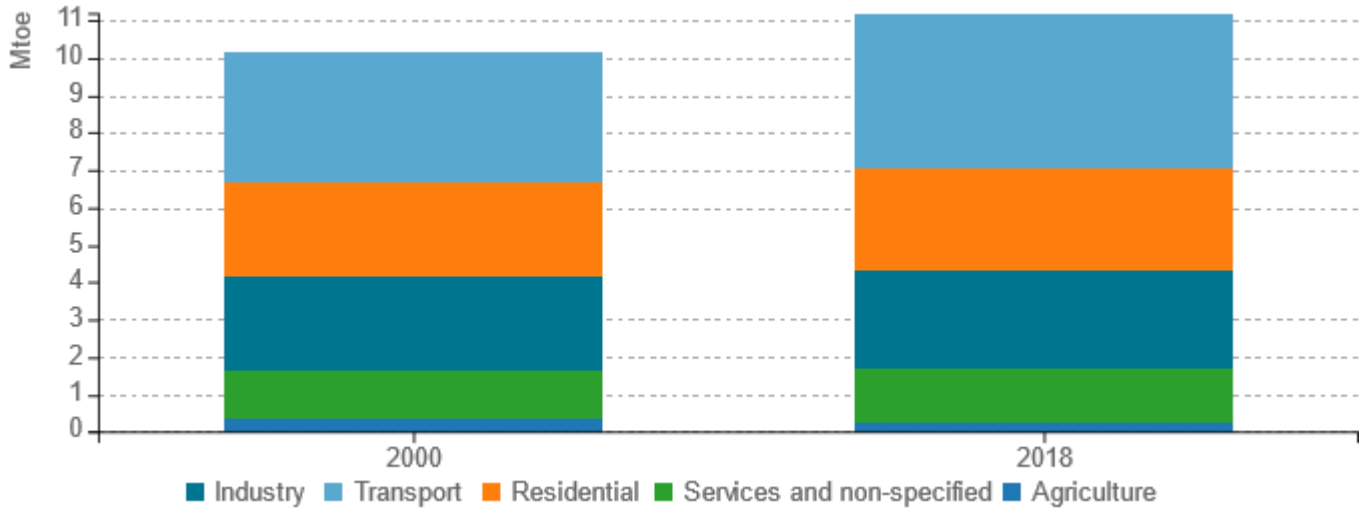
Energy efficiency trends and policies

Overview

In 2018, final energy consumption in Ireland (excluding international aviation) was 11.2 Mtoe, 10% higher than in 2000. The transport sector was responsible for the largest increase in energy demand. It increased by 17% over the period, and in 2018 accounted for 37% of all final energy use, up from 34% in 2000. The next largest sector was households, accounting for 25% of final energy use. In 2018 household energy use was 11% above that in 2000. Industry energy use accounted for 23% of final energy use in 2018, and was 2% higher than in 2000.

Figure 1: Final energy consumption by sector (normal climate)



Source: ODYSSEE

Energy efficiency for final consumers, as measured by ODEX, improved by an average of 2.1% per year from 2000 to 2018 or 32% over the period. Energy intensity in Industry reduced dramatically, due to structural changes in the economy in the early 2000's, with a move away from energy intensive industries to low energy intensity, high value-added sectors. Residential energy intensity reduced significantly after 2006, due to a combination of improvements to building efficiency, record high oil prices and reduced disposable income. The energy intensity of private cars improved after 2008. Services energy intensity improved but there is limited data available to understand the underlying drivers in this sector.

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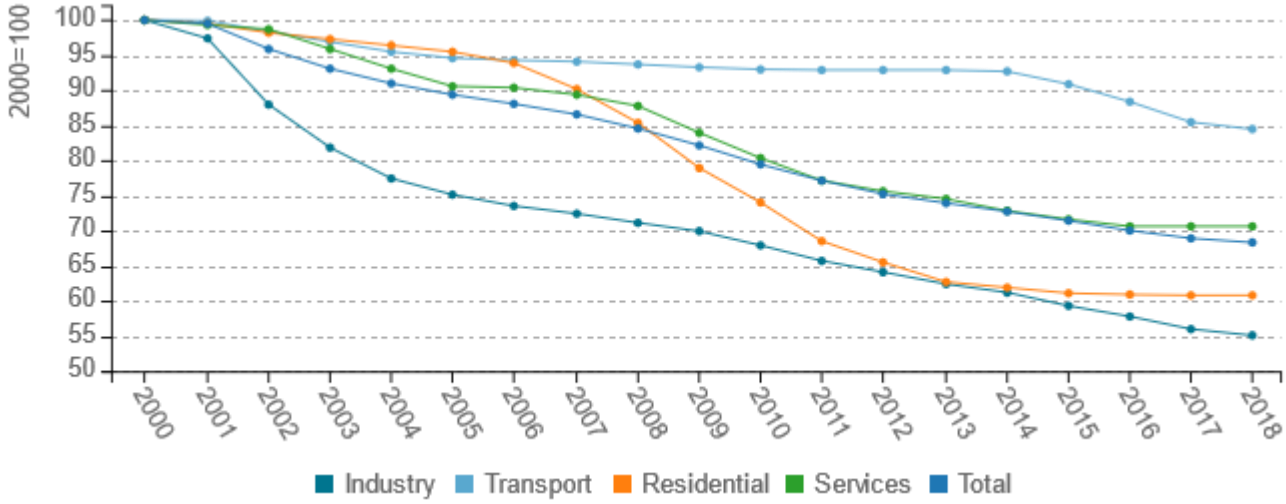
Figure 2: Technical Energy Efficiency Index



Source: ODYSSEE

Ireland's National Energy and Climate Plan (NECP) was published in 2020 and sets out Ireland's ambition for energy efficiency savings in the period to 2030. In the "With additional measures" scenario the NECP projects 62.2 TWh of primary energy savings in 2030, compared to 19.3 TWh already achieved in 2018. As well as the NECP, Ireland's 4th National Energy Efficiency Action Plan (2017), National Mitigation Plan (2017), Long Term Renovation Strategy (2017) and National Development Plan (2018) set out the policies, measures and programmes that Ireland is already undertaking, developing and considering to achieve energy efficiency and climate objectives. Policies and measures target savings in all sectors, especially in the built environment. The carbon tax is an example of a cross-sectoral measure, this was increased to €33.50 per tonne of CO2 in the 2021 budget. Supply side measures on the electricity or gas networks can also be considered cross-sectoral, an example is the targets for improvements in the energy efficiency of the electricity transmission network set by the Commission for Energy Regulation for the Transmission Service Operator. Another new measure is the establishment of the SEAI Behavioural economics unit, which aims to use behavioural science to better design energy efficiency programmes.

Table 1: Sample of cross-cutting measures

Measures	NEEAP measures	Description	Expected savings, impact evaluation	More information available
Carbon tax	yes	Tax on solid and liquid fossil fuels based on the amount of carbon dioxide produced during combustion of the fuel (€/tonneCO2)	Unknown	https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/216

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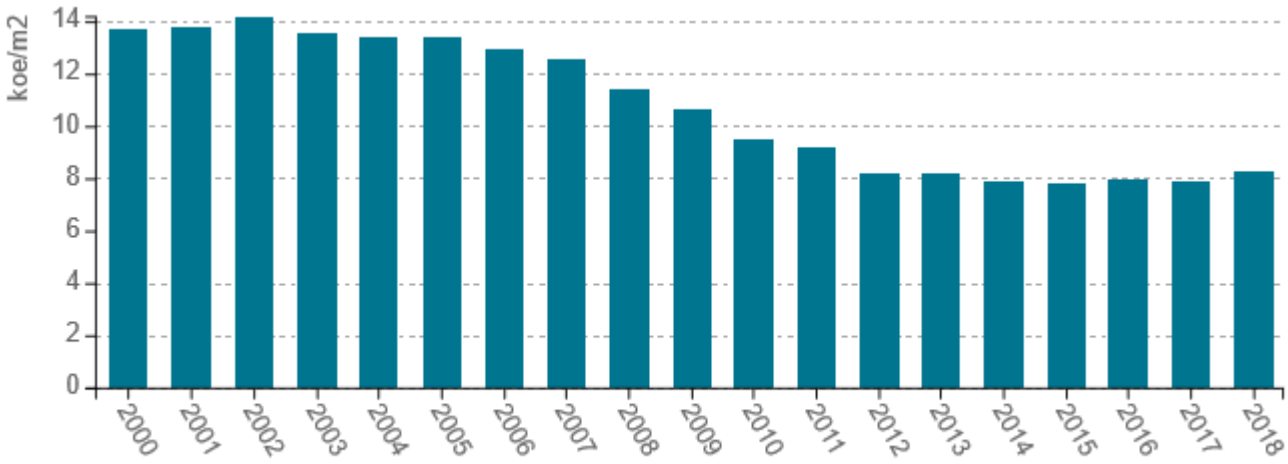
SEAI Behavioural Economics Unit	yes	The work programme aims to improve uptake of SEAI's energy efficiency programmes. In particular, the programme intends to better understand the context in which people make decisions; use the latest research in behavioural science; and test interventions, through for example pilots, using rigorous and evidence-based methodologies to determine the effectiveness of interventions before they are scaled.	Unknown	https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/212
Energy Efficiency in Electricity Transmission and Distribution	yes	Measures to improve efficiency include placing targets for reduced losses on the Transmission Service Operator	Medium	https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/219

Source: MURE

Buildings

In households, the space heating energy consumption per m2 (normal climate) improved by 42% between 2005 and 2015. This was due to a combination of factors including improved building regulations for new dwellings and retrofitting of existing dwellings. Economic factors including the post 2009 recession and high oil prices from 2012 also lead to decreased spending on fuel and increased fuel-poverty. As Ireland emerged from the last recession in 2014, incomes increased and oil prices fell, leading to a reduction in fuel poverty, and a levelling off in the reduction in space heating. This increased by 6% between 2015 and 2018.

Figure 3: Energy consumption of space heating per m2 (normal climate)



Source: ODYSSEE

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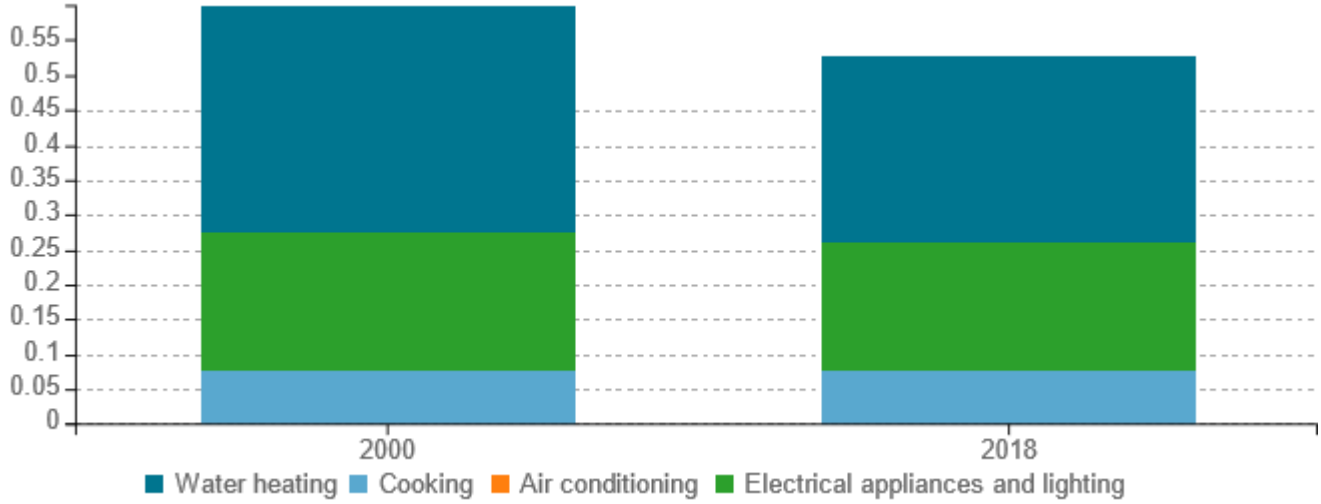
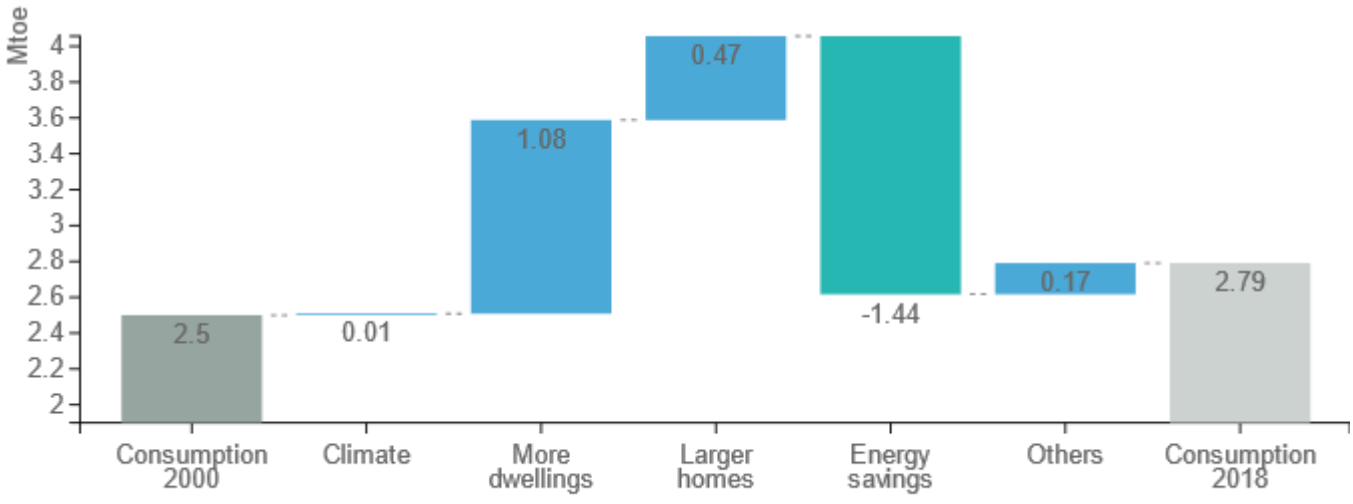
Figure 4: Energy consumption per dwelling by end-use (except space heating)



Source: ODYSSEE

Final energy consumption of the residential sector in 2018 was 12% higher than in 2000, as a result of a number of competing factors. On one hand, Ireland saw a 26% increase in population, a 40% increase in the number of households (due to increased population and decreased occupancy) and a 15% increase in the average floor area per dwelling, leading to a massive 62% increase in total floor area. However, this was largely cancelled out by a reduction in energy intensity due to a combination of energy efficiency improvements and economic factors which decreased spending on fuel and increased fuel-poverty.

Figure 5: Main drivers of the energy consumption variation of households



Source: ODYSSEE

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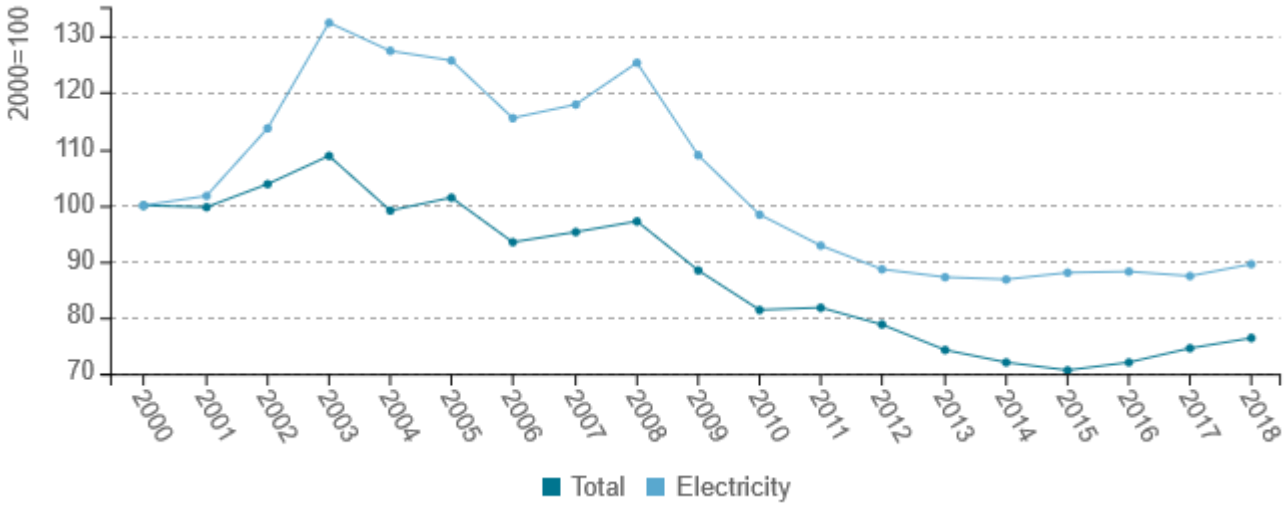
In the commercial sector, energy intensity can be expressed in terms of energy consumption per employee or per unit floor area, though data on floor area is often more difficult to obtain. The intensity of both total energy and electricity improved significantly post 2008, coinciding with the economic crisis which saw the numbers employed falling significantly. The underlying drivers here are less well understood than for households.

Figure 6: Energy and electricity consumption per employee (normal climate)



Source: ODYSSEE

Energy efficiency measures in the households have largely focused on improving the thermal efficiency of dwellings, through improved regulations on new dwellings and a programme of retrofitting for the existing housing stock. The “Better Energy Homes” scheme provides a financial incentive to private homeowners who wish to improve the energy performance of their homes. Fixed grants are provided towards the cost of a range of measures including attic insulation, wall insulation and heating systems upgrades. The vast majority of home energy efficiency retrofits carried out in Ireland, including those supported under the Better Energy Homes scheme, would be considered "shallow" retrofits. This refers to the cost and the complexity of the works carried out. A shallow retrofit involves mostly less expensive, simpler to install and less intrusive measures. While these measures are very beneficial, for many houses deeper, more expensive, more complex retrofit works are required to bring the dwelling up to an acceptable level of comfort and efficiency. To investigate the challenges and opportunities of performing deep retrofits on residential dwellings, the government launched the Deep Retrofit Pilot Programme. The lessons from this pilot will inform development of a programme for the large scale deep retrofit of buildings in Ireland.

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Table 2: Sample of policies and measures implemented in the building sector

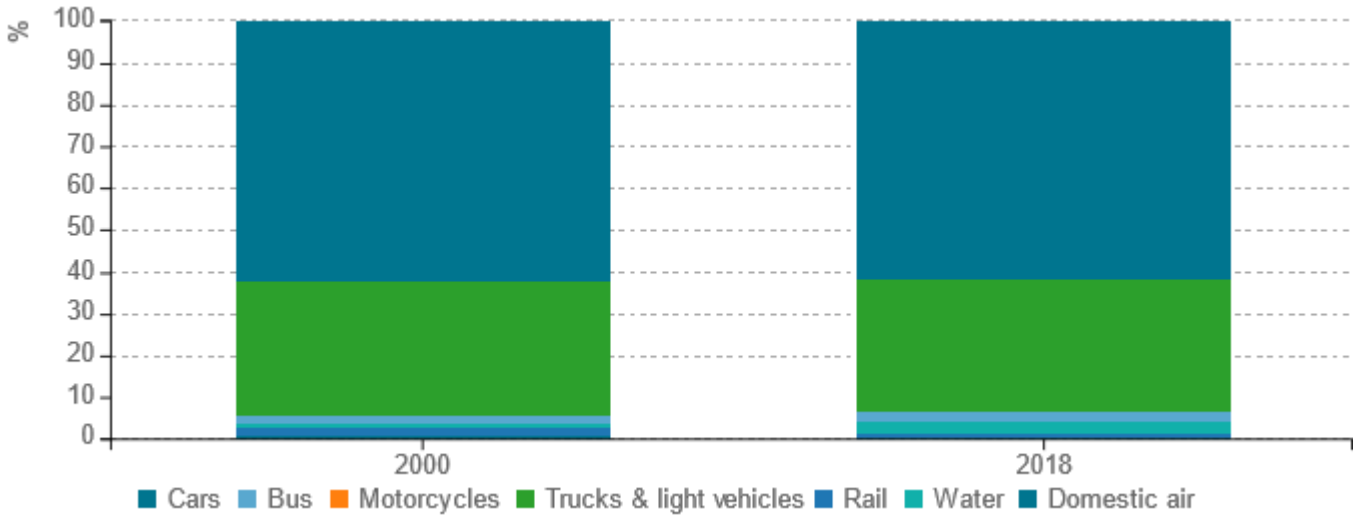
Measures	Description	Impact evaluation	More information available
Better Energy: Homes (Residential Retrofit)	This programme, implemented by the Sustainable Energy Authority of Ireland, provides capital grants to householders for the implementation of energy efficiency measures including attic and wall insulation and heating controls with efficient boilers	High	https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/723
Deep retrofit pilot programme	The Deep Retrofit Pilot Programme will investigate the challenges and opportunities of performing deep retrofits on residential dwellings. The lessons from this pilot will inform our approach and support towards the ultimate development of a programme for the large scale deep retrofit of buildings in Ireland.	Low	https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/725

Source: MURE

Transport

Overall transport energy demand in Ireland has seen periods of dramatic growth and contraction between 2000 and 2018, as transport activity remains highly sensitive to economic growth. Despite these activity changes the split of transport energy consumption by mode remained almost the same in 2018 as in 2000.

Figure 7: Transport energy consumption by mode



Source: ODYSSEE

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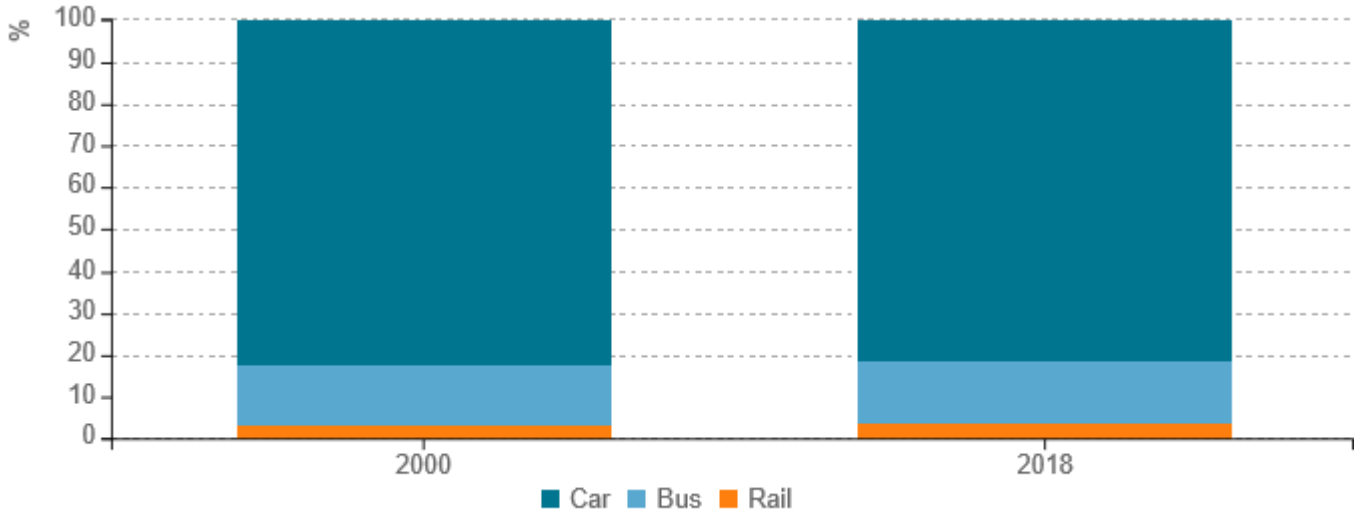
Private car transport remains the dominant mode of passenger transport, reflecting Ireland dispersed settlement patterns. Despite an increase in numbers cycling from a low base, and the introduction of a light rail system in Dublin, overall there has been little progress in modal shifting.

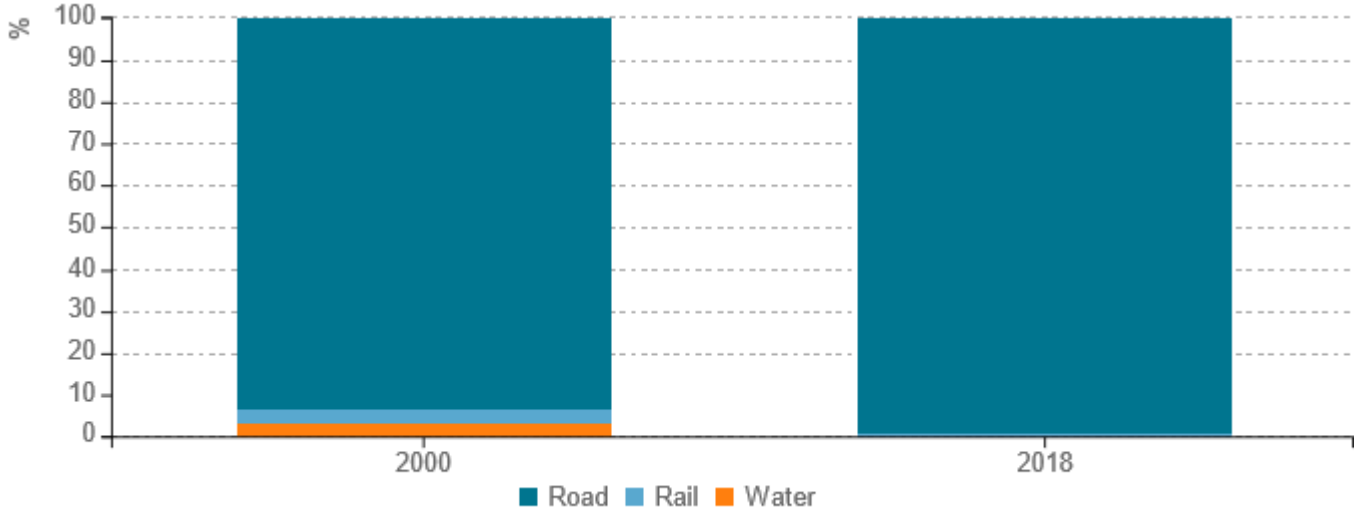
Figure 8: Modal split of inland passenger traffic



Source: ODYSSEE

Freight also remains dominated by road transport. From an already low base in 2000 the volume of rail freight decreased by over 80% between 2000 and 2018, decreasing its share of total freight from 4% to 1%. 99% of freight was transported by road in 2018.

Figure 9: Modal split of inland freight traffic



Source: ODYSSEE

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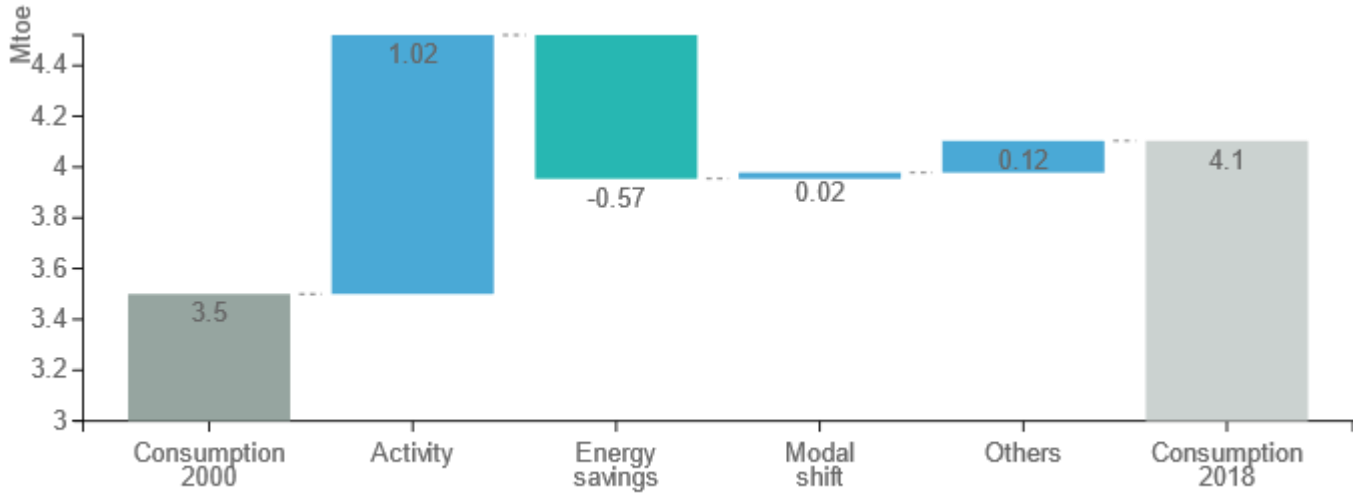
Total transport energy use (excluding international aviation) was 17% higher in 2018 than in 2000, but within that time period energy use increased 34% from 2000-2007, decreased 23% from 2007-2012 and increased 14% from 2012-2018. The decomposition analysis below shows that energy consumption increased over the period due to greater activity (passenger-kilometres for passenger cars, tonne-kilometres transported for freight), and other effects (for example fuel tourism). This was partly offset by improved energy efficiency, mostly in private cars.

Figure 10: Main drivers of the energy consumption variation in transport



Source: ODYSSEE

Vehicle registration tax and annual motor tax were determined by engine size prior to 2008. From 2008 both registration and annual motor tax were restructured to be based on the specific carbon emissions of the car, with lower emission cars liable for reduced tax rates compared to higher emission cars. In 2009, EVs were identified as an important element in efforts to achieve both energy efficiency and greenhouse gas emissions reductions targets as part of the EU Climate Change-Energy Package.

Table 3: Sample of policies and measures implemented in the transport sector

Measures	Description	Expected savings, impact evaluation	More information available
Restructuring of Vehicle Registration Tax and Annual Motor Tax	Restructuring of Vehicle Registration Tax and Annual Motor Tax on the basis of CO2 Emissions	High	https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/2205
Deployment of Low Emission Vehicles	Grants for EVs	Medium	https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/2214

Source: MURE

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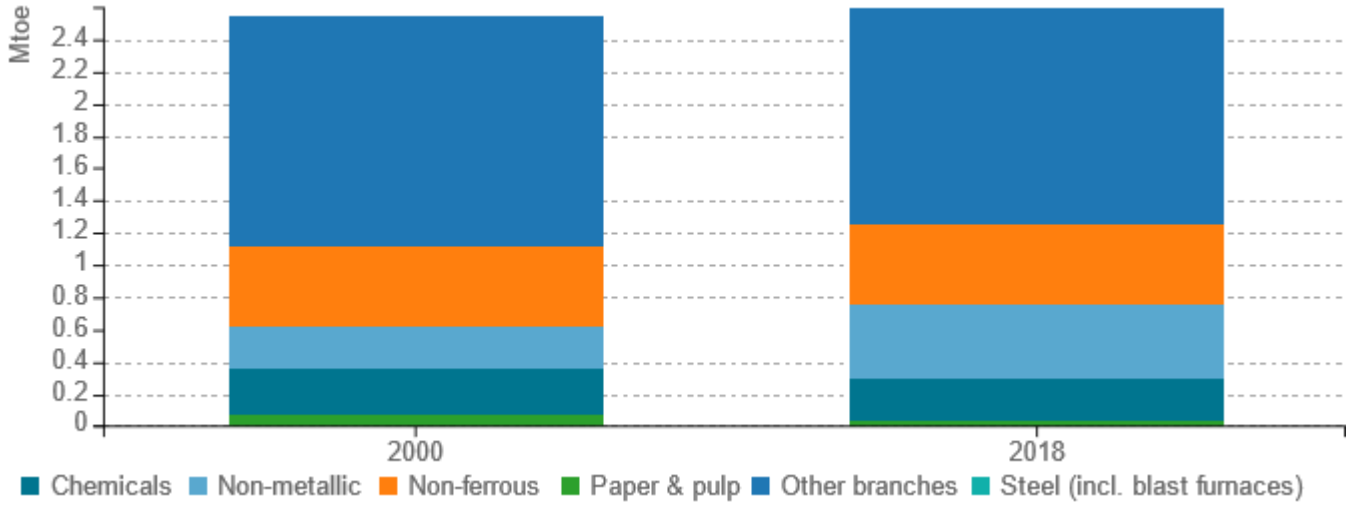
Industry

Ireland's economic structure changed considerably since 2000, shifting in the direction of high value-added, low energy intensity sectors and away from traditional "heavy" industries. Cement production (non-metallic minerals) remains a large energy user and has been strongly linked to economic growth.

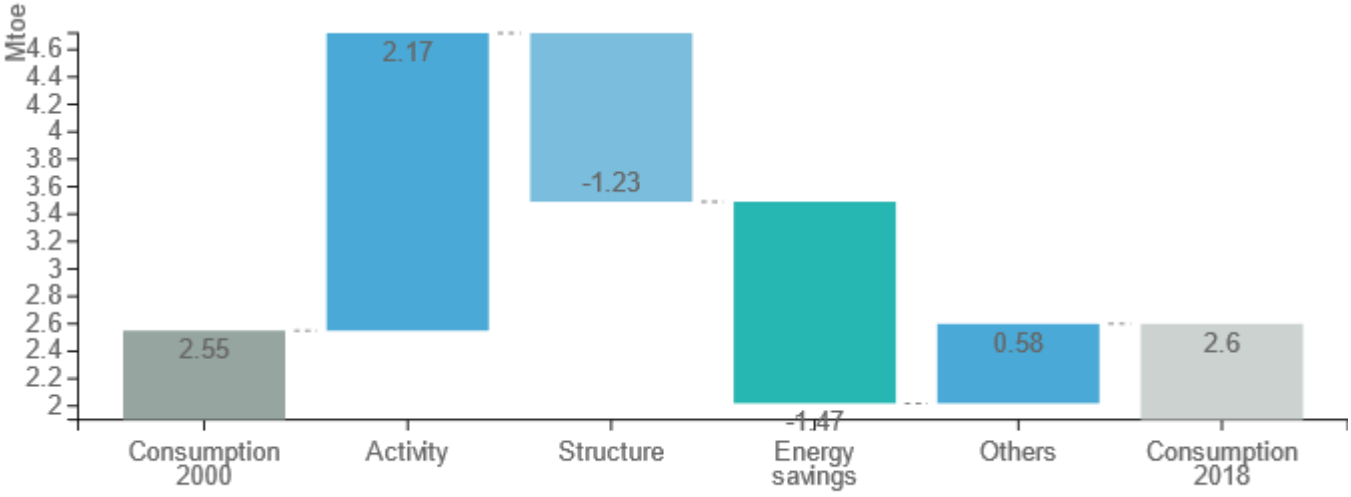
Figure 11: Final energy consumption of industry by branch



Source: ODYSSEE

Energy consumption in industry was just 2% higher in 2018 than in 2000, despite activity (measured by the production index) increasing by over 200% in that time. Some of the activities of multinational companies in Ireland result in large amounts of value added, but very little energy use. This was well illustrated in 2015 when the value added of manufacturing grew by 92% as a result of the transfer into Ireland of intellectual property. Therefore, care must be taken when examining the energy intensity of industry for Ireland.

Figure 12: Main drivers of the energy consumption variation in industry



Source: ODYSSEE

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The Large Industry Energy Network is a voluntary grouping of companies that work together to develop and maintain robust energy management. Regular networking events, workshops, seminars and site visits provide opportunities for members to meet and learn from energy experts and from fellow energy managers. The Accelerated Capital Allowance is a tax incentive which encourages companies to invest in energy saving technologies. The ACA allows companies to write off 100% of the purchase value of qualifying energy efficient equipment against their profit in the year of purchase.

Table 4: Sample of policies and measures implemented in the industry sector

Measures	Description	Expected savings, impact evaluation	More information available
Large Industry Programmes, Large Industry Energy Network (LIEN)	The Large Industry Energy Network (LIEN) is a voluntary grouping, facilitated by the Sustainable Energy Authority of Ireland, of companies that work together to develop and maintain robust energy management. Regular networking events, workshops, seminars and site visits provide the opportunity for members to meet and learn from specialists, including energy experts, and also from their fellow energy managers on the solutions that work. By learning from experts and sharing knowledge and experiences, members save valuable research time, invest wisely and maximise returns.	High	https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/1183
Tax Relief for Energy-Saving Equipment: Accelerated Capital Allowance	The Accelerated Capital Allowance (ACA) is a tax incentive which aims to encourage companies to invest in energy saving technology. The ACA allows companies to write off 100% of the purchase value of qualifying energy efficient equipment against their profit in the year of purchase.	High	https://www.measures.odyssee-mure.eu/energy-efficiency-policies-database.html#/measures/1182

Source: MURE

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