AUDIT PLUS

PESTLE analysis to determine energy efficiency levers of change of energy intensive industries in Ireland, Spain and Poland

Luciano De Tommasi

Sustainable Places 2025, 9th October 2025

SUSTAINABLE PLACES 2025

Co-funded by the European Union

Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor the granting authority can be held responsible for them.

Introduction

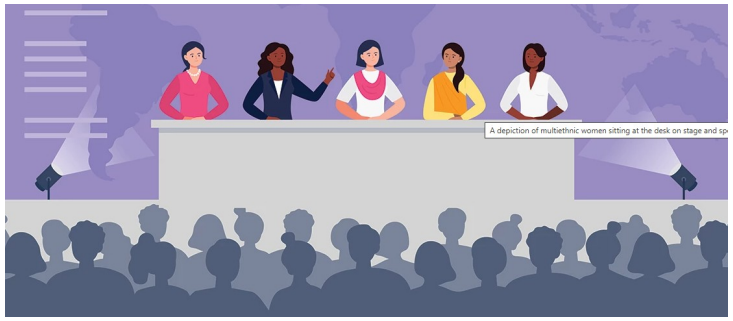
- The **AUDIT-PLUS** project (Enhancing energy audits schemes in Energy Intensive Industries with practical approaches) funded under the LIFE-CET-22 call is contributing toward improving **energy efficiency** in energy-intensive industries offering a **free consultancy service** to companies in Ireland, Spain, and Poland providing them with technical, financial, and regulatory support to implement energy efficiency measures, reduce energy consumption, and meet EU emissions targets.

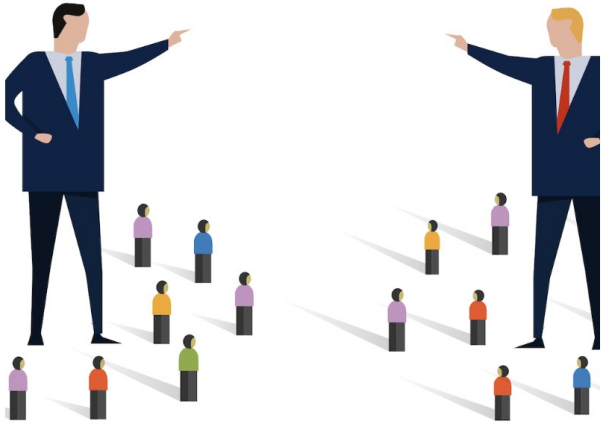
- **AUDIT-PLUS** developed an analysis of **P**olitical, **E**conomic, **S**ocial, **T**echnological, **L**egal and **E**nvironmental factors which determine levers of change for energy intensive industries toward improving energy efficiency.

- Countries/Regions: Ireland, Spain (Castellon, Galicia), Poland

Ireland: Political Factors (1/2)

- Government committed to major energy/climate/efficiency-related investments through the **National Development Plan 2018–2027** (€116 billion).
- Employment stability, regional development, and construction sector support are important themes within Ireland's NDP.
- The **war in Ukraine** led to higher oil and natural gas prices, resulting in increased household costs for heating oil, gas, electricity, diesel, and petrol.
- **Electric Ireland** raised electricity bills by +26.7% and gas bills by +37.5% (October 2023).
- Government activity focused on public campaigns promoting energy efficiency and providing new supports for families.



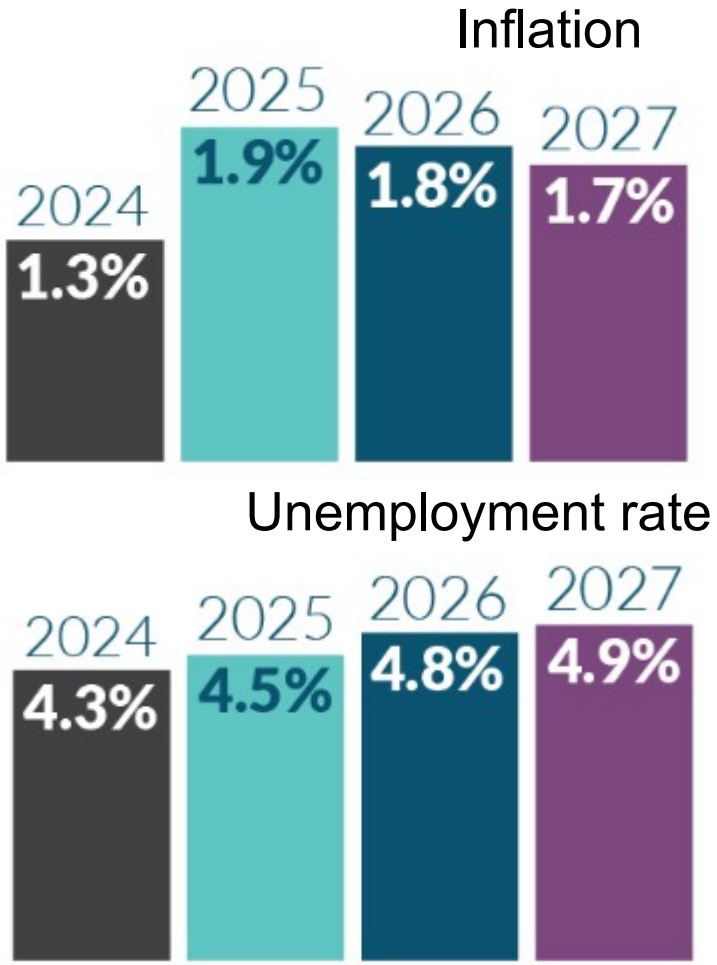


Ireland: Political Factors (2/2)

- NDP committed to invest **€21.8 billion** in the transition to a low-carbon, climate-resilient society.
- **EU trade sanctions** against Russia are legally binding in Ireland, with penalties imposed for any violations.
- **Trade restrictions** affect chemicals, lithium batteries, thermostats, UAV motors, machine tools, software.
- Ireland and the United Kingdom cooperate to ensure a **stable and secure natural gas supply** through shared infrastructure, planning, and emergency coordination.
- The **Climate Action Plan 2025** sets ambitious targets for reducing carbon emissions.
- The **Hydrogen Strategy, National Energy and Climate Plan 2021–2030, and National Recovery and Resilience Plan** provide pathways for decarbonisation, support for small and medium-sized enterprises, and the digital transition.
- **Energy security to 2030** focuses on shifting from fossil fuels to an electricity-led energy system.

Ireland: Economic Factors (1/2)

- Inflation peaked in November 2023 (highest since 1984), mainly due to Ukraine war.
- Ireland may experience some **economic relief** as gradually declining **energy prices** and **government measures** aimed at restoring real incomes help reduce household cost-of-living pressures.
- Unemployment dropped from >15% (2010s) to 4.9% in Dec 2023.
- **Full employment** can lead to **rising wages** as employers compete for workers, which may **reduce productivity** and **overall competitiveness**.
- The **Irish economy** is highly advanced, with strong sectors in **high technology**, **life sciences**, **financial services**, and **agribusiness**.



Ireland: Economic Factors (2/2)

- **GDP structure** (2021): Services: 59% Manufacturing: 37% Construction 3% Agriculture: 1%
- **Expenditure structure (2024)**: private consumption 30.8%, investment 26.6%, Government consumption 12.3%, Net exports 30.3%.
- 2023 GDP fell -0.5% to -1% (weaker exports, especially pharma & medical products).
- **Growth prospects**: +3–3.5% GDP in 2025 through rising wages, exports, investments.
- Risks to the economy include a **housing shortage**, which can drive up prices, and a **volatile energy market** that may create uncertainty for households and businesses.

Business supports: Non-Domestic Microgen Grant (solar PV), Support Scheme for Renewable Heat, EXEED Certified Grant Scheme, Energy Efficiency Obligation Scheme, Accelerated Capital Allowance, Renewable Heat Incentive

Ireland: Social Factors

- **62% of 25–34 year olds** have third level education (vs. EU average 41%).
- High quality of life, strong employment in tech, banking, pharma.
- Cost of living higher than EU average, especially in Dublin & Cork.
- **79% of consumers** adopted cost-saving behaviours in 2023: switching brands, seeking promotions, cutting non-essential spending.
- Ireland has a median age of **38 years**, and ongoing population growth is contributing to a young and well-educated workforce.
- Strong belief in science (89%) and pharma trust (60%).
- Public sees pharma as a driver of jobs, innovation, and quality of life.

Ireland: Technological Factors

- **Energy-intensive industries** demand renewable energy, efficient motors, compressed air optimization, improved steam efficiency, LED lighting, smart meters, solar photovoltaic systems, and energy storage solutions.
- **Pharmaceutical industries** require efficient machinery such as reactors, centrifuges, dryers, and blowers, as well as fiber-reinforced plastic blades, natural lighting systems, and energy monitoring and management technologies.
- There is a need for **obsolescence management plans** and **strong supplier relationships** to mitigate downtime risks.
- **Workforce development** includes training and awareness programs focused on energy efficiency.
- Opportunity to foster a **culture of energy saving and sustainability.**

Ireland: Legal Factors

- EU **Energy Efficiency Directive (EED)** implemented via **Energy Efficiency Obligation Scheme** and **alternative measures**.
- **Pharmaceutical regulations** (e.g. authorisation from the Health Products Regulatory Authority, Good Manufacturing Practice certification, and related product controls) *make energy efficiency upgrades more complex and slower to adopt*, as <u>any facility change must be validated</u> to ensure it does not compromise product quality or regulatory compliance.
- **CE marking regulations** might slow down implementation of energy efficiency measures because changes affecting a device's validated conditions must be assessed and revalidated to maintain compliance.

Ireland: Legal Factors

Energy Efficiency Obligation Scheme

- Ireland's main mechanism for meeting Article 7 of the EED.
- Requires large energy suppliers/distributors ("obligated parties") to deliver verified annual energy savings.
- Savings are achieved through funded efficiency upgrades in homes, businesses, and public sector (e.g. insulation, lighting, heating systems).
- Administered by the Sustainable Energy Authority of Ireland (SEAI) under S.I. No. 522 of 2022.
- The scheme allows trading of **verified energy credits** between obligated parties.

Alternative Measures

- Complementary government programmes that also deliver measurable energy savings.
- Public retrofit grants, social housing and public sector upgrades.
- Industrial/commercial efficiency supports and tax incentives (e.g. Accelerated Capital Allowance).
- Transport efficiency and other national policy measures.

Ireland: Environmental Factors

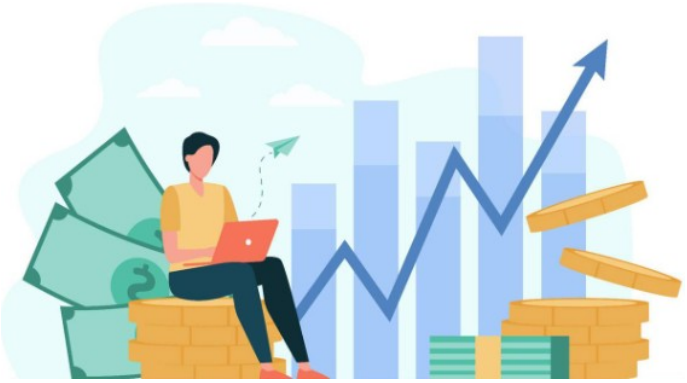
- **Climate change impacts:** +0.8°C since 1900, +5% rainfall since 1980s, rising sea levels (+3.6mm/year).
- **Risks:** flooding, coastal erosion, infrastructure damage in major cities.
- **Air pollution:** nitrogen dioxide, PM, ozone, PAHs cause 1,300 premature deaths annually.
- **Transition towards circular economy:** reduce 100+ million tonnes of waste/year.
- **Electricity consumption:** 30.6 billion kWh/year (108% covered by domestic production).
- **Opportunities:** expand renewable energy, integrate into EU grid, shift away from fossil fuels.
- **Waste management:** EPA & local authorities support recycling activities, but some businesses lack policies/support.

Castellon, Spain: Political Context

- The 2023 regional elections in the **Valencian Community** led to a change in government, creating uncertainty about the continuity of funding for energy efficiency measures.
- The war in Ukraine caused energy price increases.
- EU initiatives such as the European Green Deal, the REPowerEU plan, and Directive 2023/1971 promote energy efficiency in Castellón by setting **binding targets**, providing **regulatory frameworks**, and offering **financial and technical support** for sustainable energy measures.
- Spain's **Energy Saving Certificates** (Royal Decree 36/2023) encourage energy efficiency in Castellón by allowing companies to **earn and trade certificates** for verified energy-saving actions, helping reduce the cost of implementing these measures and promoting sustainable practices.

Castellon: Economic & Trade Factors

- **Rising costs** of energy, transportation, and raw materials.
- **Final product prices** increased, reducing competitiveness.
- In 2022, the ceramic industry faced **negative impacts**, including the loss of over 1,000 jobs and reduced exports due to trade restrictions in Egypt, Saudi Arabia, and Algeria.
- The **European Union** introduced **anti-dumping measures** on ceramic tile imports from India, China, and Turkey to protect the EU market and help restore the competitiveness of Spanish ceramics.



Castellon: Social, Technology & Environment

- **Public support** for sustainability and renewable energy is increasing.
- The **ceramic sector** is energy-intensive and contributes significantly to Spain's GDP.
- **Upgrading equipment** is challenging because it is expensive and has a long lifespan.
- **Opportunities** include adopting energy-efficient and renewable technologies, reducing and recycling waste, and improving overall energy efficiency.

Galicia, Spain: Energy & Policy Factors

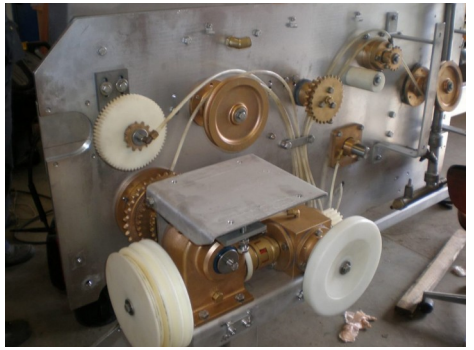
- **Ukraine war** increased global oil, gas, and fuel prices.
- High costs of equipment and technology have slowed down **short-term** investments in energy efficiency.
- In the **long term**, higher energy prices make efficiency improvements more attractive.
- In Poland, **funding support** for energy efficiency is available from regional sources such as INEGA, national programmes like Energy Saving Certificates, PERTE, and IDEA, as well as from the European Union.

Galicia: Economic & Social Factors

- The **agro-fishing sector** has been negatively impacted by the arrival of cheap food imports from abroad.
- **Imported products** often do not meet Spanish quality standards.
- As a result, local producers face **unfair competition** and a reduced market share.
- **Inflation** remains high, while the **unemployment rate** has been steadily declining since 2020.
- Rising **energy and material costs** are reducing profitability in energy-intensive industries.

Galicia: Technology, Legal & Environment

- In Galicia, the growth of **energy management practices** has led to the creation of dedicated **energy manager roles**.
- **Public awareness** of energy waste and the benefits of renewable energy is steadily increasing.
- **Photovoltaic panels** are increasingly cost-effective for installation in homes and public buildings.
- **Barriers** include **limited subsidies** and **low budgets**, **lack of reliable return-on-investment data**, and **outdated machinery** in the agro-fishing industry.
- **Progress** includes **recycling organic waste**, such as fish processing water and animal excrement, and repurposing it as sources of protein or fuel.
- Ongoing issues include the unresolved problem of **microplastic pollution** in the sea.



Poland: Political & Legal Stability

- **Political stability** encourages industrial investment, especially in food sector.
- **Ukraine war** increased energy prices and created supply risks.
- **Legal drivers** for energy efficiency in energy-intensive industries include **national laws**, **mandatory audits**, and compliance with **European Union directives**.
- **Energy audits** help industries identify energy-saving opportunities, reduce costs, and enhance competitiveness.

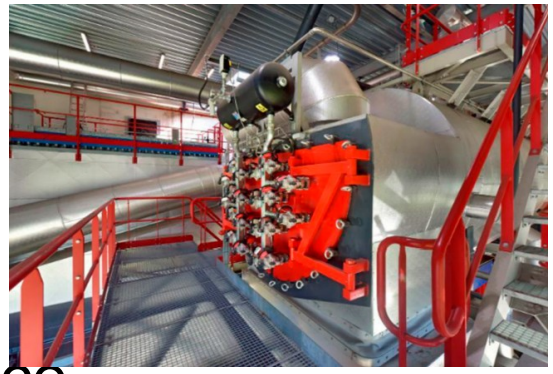
Poland: Economic & Social Factors

- **Inflation** and **reduced GDP** growth affect industrial investments.
- A high unemployment rate providing a ready labour supply can **facilitate the uptake of energy efficiency measures in energy-intensive industries** because companies have easier access to workers for implementing upgrades, retrofits, and energy-saving projects without facing labour shortages or increased labour costs.
- Consumer dynamics include a growing preference for **eco-friendly products**, while reduced incomes increase demand for more **affordable products**.
- **Tax policies** influence adoption of energy efficiency measures.
- **Incentives** can encourage investment in energy efficiency.

Tax Incentives

Poland: Technology & Environment

- **Growing demand** for energy-efficient technologies in food sector.
- **Energy audits** play a critical role:
  - Detect obsolete equipment
  - Improve planning for efficiency upgrades
  - Ensure new technologies deliver real savings



- **Energy audits** also improve workplace safety and compliance.
- **Environmental benefits**:
  - Reduced emissions
  - Better waste management
  - Integration with recycling and circular economy initiatives

- Overall, energy audits enhance both **productivity** and **sustainability**.

Summary & Conclusions

Overall Findings

- PESTLE analysis performed for **Ireland, Castellon, Galicia, and Poland**.
- **Common challenges** across all regions:
  - The **war in Ukraine** has driven up energy and fuel prices.
  - **High inflation** has led to increased operational costs for energy-intensive industries.
- As a result, **investments** in energy efficiency have declined, along with demand for **energy audits**.

Summary & Conclusions

Influence of political & policy drivers

- **Political stability** supports long-term energy efficiency policies.
- **National and EU grants/subsidies** are strong enablers of energy audits.
- Regional risks in Valencia include **uncertain budget support** for the ceramics sector following a change in local government.
- **Trade restrictions** reduce revenues and can hinder investments in energy efficiency projects.

Summary & Conclusions

Influence of economic factors

- A decline or slowdown in **GDP** can lead to fewer investments in energy audits.
- **High inflation** raises product prices, reducing sales and profits, and leaving fewer resources available for energy efficiency measures.
- **Tax incentives** act as positive drivers for industry investments in energy audits.

Summary & Conclusions

Influence of social factors

- **Labour market**:
  - **Low unemployment** in countries like Ireland and Poland boosts **productivity** and **industrial competitiveness** by providing a stable, skilled workforce, but it can also raise wages and **labour costs**, creating a **trade-off** for industries.
  - **High unemployment** makes it easier for companies to recruit skilled workers.
- **Consumer income**:
  - Low income shifts demand to cheaper imports (e.g., Galicia food products).
  - New regulations may protect local producers and product quality.
- **Consumer preferences**:
  - In Poland, increasing demand for **eco-friendly products** act as a driver for energy audits.
  - **Higher education** levels increase awareness of energy efficiency opportunities.
  - **Public perceptions** view ceramics as durable and low-maintenance, pharmaceuticals as beneficial for health and quality of life, and fish products as high-quality meals.

Summary & Conclusions

AUDIT PLUS

Influence of technological and environmental factors

- High demand for **energy-efficient equipment & devices** in Energy Intensive Industries.
- Energy audits are critical for:
  - Identifying outdated technologies.
  - Supporting decarbonisation strategies.
  - Reducing CO_2 and other pollutants.
  - Enabling recycling & circular economy initiatives.

SUSTAINABLE PLACES 2025

Luciano De Tommasi – email: luciano.detommasi@ierc.ie
Ruchi Agrawal – email: ruchi.agrawal@ierc.ie

Co-funded by the European Union

Co-funded by the European Union. Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or CINEA. Neither the European Union nor the granting authority can be held responsible for them.