UNDER 2°

SECRETARIAT THE CLIMATE GROUP

# INDUSTRY ENGAGEMENT INNOVATION LAB

**ENERGY TRANSITION PLATFORM POLICY BRIEFING | NOVEMBER 2017**

Innovation Labs are the second phase of The Climate Group's Energy Transition Platform, a project which connects 11 highly industrialized, carbon-intensive states and regions seeking to transition to a clean energy future. The Energy Transition Platform enables these governments to share experiences and successful initiatives, and helps them overcome barriers and adopt innovative clean energy policies.

Innovation Labs accelerate this work by facilitating workshops, group calls and best practice case studies. The Grantham Institute – Climate Change and the Environment is the knowledge partner for the Innovation Labs, providing research tailored to each government.

This policy briefing outlines some of the key learnings from the Industry Engagement Innovation Lab, as well as recommendations for state and regional governments seeking to engage with their local industries as part of their clean energy transition.

Government partners of the Industry Engagement Innovation Lab are Minnesota (US), North Rhine-Westphalia (Germany) and Wales (UK).

## EXECUTIVE SUMMARY

Incentivizing energy efficiency uptake and decarbonization of the industrial sector is an extremely challenging task.

The governments of the Innovation Lab are faced with similar barriers and challenges when trying to engage with industry. Industries themselves are concerned with reliability, security and cost of energy supply and many are facing economic challenges. This means that governments are wary of placing additional pressure on them. In addition, industrial processes are heterogeneous and made up of complex processes which means that there is no 'one size fits all' approach that can

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be applied. Policies need to be tailored to the specific needs of the sectors and regions. This made it challenging to identify success stories and lessons within the Lab which could be applied to other regions. However, two key lessons that are common to all regions and supported by the literature are:

- Establishing open means of communication with industry and a level of trust is essential for successful engagement with industry
- It is necessary to establish a baseline understanding of the current actions and needs of industry (i.e. what has been done already and what are remaining areas for improvement) in order to determine the most appropriate policy response.

The overall aims and key questions of the participating governments are summarized in Figure 1.

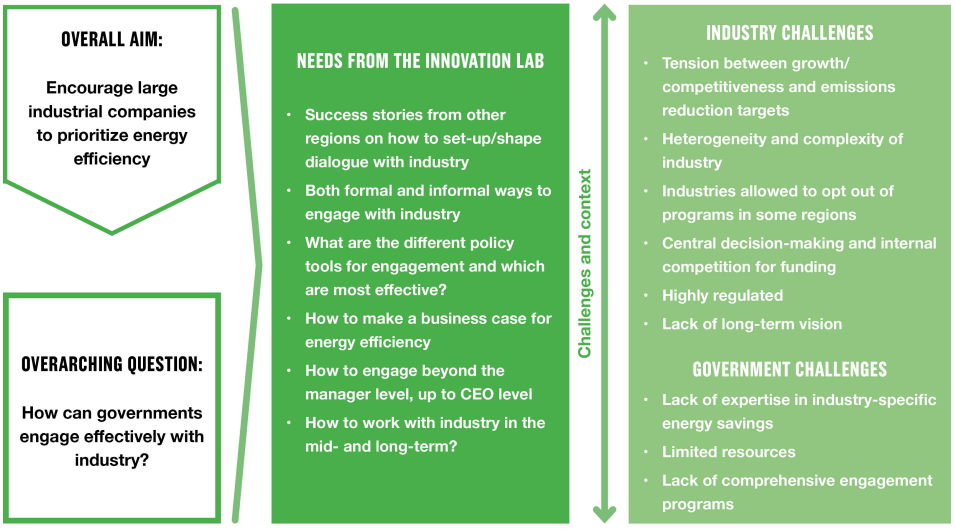


Figure 1 - Overall aim and research questions arising from the Industry Engagement Innovation Lab

## EVIDENCE FROM THE LITERATURE

For this work, we consulted the literature to find evidence on the following questions:

- What are the best practice examples found in the literature?
- What is the best way of demonstrating the value of energy efficiency and decarbonization?
- What are the main toolkits to support energy efficiency and decarbonization in industry?

A report[1] by the US Department of Energy, as part of their State and Local Energy Efficiency Action Network (SEE Action), details the different approaches which have been taken by states and explores the practical lessons and best practices from a wide range of programs that have been implemented. According to the report, effective programs (1) evolve over time and are continuously refined to improve effectiveness, (2) consist of a combination of approaches and (3) understand the needs of manufacturers and are tailored or customized to respond to these needs. The key features

[1] US DoE (2014). Industrial Energy Efficiency: Designing Effective State Programs for the Industrial Sector. A report by the State and Local Energy Efficiency Action Network.

of programs which effectively respond to the needs of the manufacturing industry and are most successful at incentivizing energy efficiency uptake are:

- Clearly demonstrating the value proposition of Industrial Energy Efficiency (IEE) projects to companies.
- Developing long-term relationships with industrial customers that include continual joint efforts to identify IEE projects and build trust.
- Ensuring program administrators have industrial sector credibility and offer quality technical expertise.
- Offering a combination of prescriptive and custom options to best support diverse customer needs.
- Accommodating scheduling concerns. i.e. capital project implementation, operational schedules and capital investment cycles.
- Streamlining and expediting application processes.
- Conducting continual and targeted program outreach.
- Leveraging partnerships.
- Setting medium to long-term goals as an investment signal for industrial customers.
- Understanding proper project measurement and verification and completing program evaluations.

The business case for energy efficiency and decarbonization can be presented by communicating the co-benefits of energy efficiency (such as increased operational efficiency and productivity, improved product quality, hedging against energy price volatility etc.)[1]. Evidence shows that there is a strong positive relationship between energy efficiency and productivity and that if these productivity benefits are explicitly included in the cost analysis it can result in a doubling of the cost-effective potential for energy efficiency improvement[2]. An example in a paper by Lung et al.[3] shows that the payback time for an energy efficiency improvement on the compressed air system of a cement plant reduced from 4.63 to 1.64 when ancillary benefits were included.

Encouraging the implementation of decarbonization measures beyond energy efficiency can be more challenging as many of the technologies are more expensive and, in the absence of a carbon price, these do not have immediate cost savings. However, some ways of engaging firms to be active in this area include: communicating the risks of climate change and the potential direct impacts on a company (e.g. raw material supply disruption due to weather impacts); creating pressure along the supply chain to decarbonize (e.g. retailers preferentially purchasing from suppliers that can prove they are low carbon and sustainable); highlighting the reputational advantage of being low carbon and sustainable and supporting this by acknowledging and praising firms that are actively decarbonizing (e.g. through competitions and awards); supporting R&D projects to investigate new low carbon technologies and processes.

A key source of information on policy tools and measures for supporting policies is the Institute for Industrial Productivity's International Efficiency Policy Database. In general, policy tools are a key

[2] Worrell, E. (2003). Productivity benefits of industrial energy efficiency measures. Energy, 28, 11, 1081-1098.
[3] Lung, R., Mckane, A., Leach, R. and March, D. (2005) Ancillary Savings and Production Benefits in the Evaluation of Industrial Energy Efficiency Measures. Proceedings from the ACEEE Summer Study on Energy Efficiency in Industry

element of successful policy packages. Careful design of policy tools can offer crucial support for companies to assist them in complying with regulations and meeting targets by overcoming barriers such as lack of information or resources.

## GOVERNMENT PROFILES

### Minnesota, US

Minnesota is situated in the northern section of the mid-west of the US, bordering Canada. It is a wealthy state with a high standard of living and education levels. The main industrial activities include forestry and mining.

A key objective for the Minnesota state government is to improve the energy intensity of its industries. As such, the government provides a range of financial and technical assistance to support energy efficiency improvements including utility rebates, incentives, grants for energy efficiency or renewable energy systems (such as the Conservation Applied Research and Development (CARD) program), loans and leases.

A key policy is the Conservation Improvement Program (CIP). This is a state-wide program which is administered by energy utilities. As part of this program, utilities are required to develop a plan to improve the energy efficiency of their customers and meet certain energy efficiency targets. Utilities are also required to invest at least 1.5% (for electric) and 0.5% (for gas) of their gross operating revenues in CIP activities annually. The program is funded by rate payers themselves, with industrial customers paying their share based on their contribution to load. Participants are then eligible for financial incentives for energy efficiency improvements from their utilities. Overall, the program has been considered very successful in moving efficiency investments forward. It is estimated that for every dollar invested in the CIP, US$4 to US$4.30 in energy savings, environmental benefits, and new economic activity is gained[4]. However, as of three years ago, some large industrial customers (mainly from the mining, timber, pulp and paper, and fuel processing industries) have chosen to opt out of the program, as they didn't see the economic benefits of staying in once the lowest hanging fruits had been dealt with. This has left a gap in the state-wide policy portfolio that the government needs to address. While it is believed that many of these industries continue to invest in energy efficiency on their own, the government now has limited interaction with them about these activities.

In 2015, the state of Minnesota introduced a low interest fund to finance energy efficiency projects, known as the 'Rev It Up Program'. This was set-up because the lack of low-cost financing was identified as a barrier to energy efficiency investments. The main goal of the Program was to provide financing for energy efficiency and renewable energy systems. It would offer low-cost, long-term financing directly to local units of government for investment in community-based energy efficiency and renewable energy systems, or serve as conduit financing for commercial, industrial, small businesses or non-profit organizations seeking investment in similar systems.

[4]Cadmus Group (2015), Aggregate Economic Impact of the Conservation Improvement Program 2008-2013. Prepared for the Minnesota Department of Commerce. COMM-20140512-87354. mn.gov/commerce-stat/pdfs/card-report-aggregate-eco-impact-cip-2008-2013.pdf

However, both legal and administrative barriers, including challenges related to regulations around eligibility to receive bond funds, ultimately led to the Program being cancelled. The Department of Commerce is currently evaluating a path forward for the Rev It Up, including necessary conditions to develop a successful program, and projects that can benefit from the bonding available.

Currently, there are three main channels of communication between government and industry: (1) with energy managers at a facility level, (2) through regulatory attorneys and (3) through trade groups (environmental or union organizations). Typically, energy managers are up to date with the available options for improving energy efficiency, but fall short of being able to present a business case and convince management to invest. By comparison, the message from regulatory attorneys is that it is in the industry's interest to be as efficient as possible and therefore they have already implemented cost-effective efficiency improvements. The government has found that industry engages in discussions around energy efficiency in general, but is less open to discussions on new policy frameworks. This is particularly the case for larger scale industries such as utilities that have been reluctant to submit to increased regulation.

The overriding concern for industrial customers is the price of energy. Even though most industry in Minnesota is located there for natural resource extraction (such as mining and timber), and thus relocation is less of a concern, fears of loss of competitiveness and jobs limit governmental actions. Furthermore, support from the national level is decreasing. As a result, the current political environment is not conducive to establishing an energy efficiency mandate on industrial energy consumers.

To address these challenges, the Minnesota government has identified the following priorities:

- Conduct a state-wide study of energy efficiency potential that will include industrial energy efficiency potential of utility systems. The government will design and conduct energy intensity surveys to collect data on energy efficiency and get a better picture of what the industry has already done and the remaining potential.
- Identify ways to empower industrial energy managers to make a more compelling case to management about the financial and other benefits associated with specific energy efficiency investments.
- Identify trusted intermediaries to bridge the communication gap between government and industry. These could be industrial process engineers with expertise in the plant efficiency opportunities in industrial sectors, who would then be able to deliver specialized energy efficiency expertise and support. Alternatively, the Chamber of Commerce could be a good intermediary to deal with the industry.

## North Rhine-Westphalia, Germany

North Rhine-Westphalia (NRW) is Germany's most populous federal state, with around 18 million inhabitants. With a GDP of 599.8 billion euros, the state is a hub of economic activity and highly energy intensive industries including coal production, power generation and manufacturing such as steel, chemicals and cement. As a result, the region contributes to around one third of Germany's greenhouse gas (GHG) emissions. NRW has been a leading example of action on climate change,

being the first German state to adopt its own Climate Protection Law (CPL) in 2013. The CPL sets a GHG emissions reduction target of 25% by 2020 and 80% by 2050 (relative to 1990 levels). Included in this law was the mandatory development of a 'Climate Protection Plan (CPP)' to develop pathways for achieving these targets through a participatory method. The CPP process was considered highly successful and similar approaches have now been carried out in other regions and at a national level. As a result, this process is investigated in more detail in the Case Study section below.

**Case study - Development of the Climate Protection Plan**

The main goal of the Climate Protection Plan (CPP) was to understand the potential for emissions reduction in the different sectors and to define pathways for achieving the high-level targets set out in the Climate Protection Law (CPL). These pathways broke down the targets at a sectoral level and included timeframes and region-wide intermediate goals. They were used to develop policies to support the achievement of the high-level targets.

A defining feature of the development of the CPP was that it was based on a fully participatory and iterative stakeholder engagement process at all stages. This arose from the desire to overcome the limitations of the traditional approach to policy development, which often follows a linear path beginning with scientific studies, stakeholder engagement and development of recommendations, ultimately used by government to develop a plan. Instead, this approach incentivized industries to participate and make their voices heard.

The aim of this approach was to[5]:

- Maximize transparency
- Maximize acceptance and public engagement
- Integrate expert know-how
- Create an appropriate implementation culture
- Stimulate new cooperation schemes
- Invite joint approaches

Representatives from the following stakeholder groups took part in the consultations and workshops: steel, aluminum, chemicals, cement, paper, machinery, electrotechnical, energy, entrepreneur association, environmental non-governmental organizations (NGOs), government agencies, academia, trade unions, municipalities, State Government and the Church. Phase 1 ran from September 2012 to November 2013 and involved the conceptualization of the CPP with involvement from over 400 stakeholders. The output from Phase 1 was interim draft scenarios. Phase 2, which began in March 2014, involved final specification of the scenarios, impact analysis and further networking with extended stakeholder organizations (about 800 stakeholders). The output of Phase 2 was the draft Climate Action Plan, which was published for online consultation and received over 1,500 replies, before being submitted to Parliament for final approval.

[5] Presentation by Stefan Lechtenböhmer on 'Platform Climate Protection and Industry North-Rhine Westphalia' presented to the ECEEE 2016 conference on the 14th September 2016, Berlin, Germany

**Resources**:
The CPP was extremely resource intensive. The process lasted two years and was funded almost entirely by the government, together with research grants for supporting studies. The project group, based in the Ministry of Environment, consisted of six to 10 high-level policy officers. The project was also supported by an external consultancy consisting of a team of three to four people. There was also a scientific consultation with six academics.

**Enabling conditions**:
There were a number of enabling conditions and actions which contributed to the success of the CPP. The existence of the Climate Protection Law (CPL) was a key enabler. The CPL itself was driven by pressure on the local government owing to the NRW region being such as big emitter in Germany. This resulted in some momentum and willingness to act. Further enabling conditions included:

- The whole process was backed by strong political will;
- The government gave the stakeholder process a lot of time, allowing almost two years of stakeholder engagement working groups for all different sectors. As a result, participants got a chance to talk to governments and other stakeholders and make their opinions heard. This did slow the process down, but it resulted in a plan that has been accepted and supported by all stakeholders and is deemed very successful;
- Working groups were held with all levels, including both operational level and senior management. Other events were also held in parallel (e.g. Climate Business Event) and were attended by board-level company representatives. These events allowed for networking and knowledge sharing between stakeholders;
- The bottom-up modelling approach was well-suited for the development of scenarios using a participatory stakeholder process;
- Non-industry stakeholders often had views which conflicted with those of the industry and pushed for the consideration of more ambitious technologies and actions.

**Challenges**:
- The industry stakeholders needed sufficient technical knowledge in order to fully contribute to scenarios development;
- There was a tendency to underestimate long-term mitigation potential as the method was focused on currently available technologies;
- Industry representatives tended to favor conservative assessments of mitigation potential;
- Industry representatives tended to overestimate the performance of their own processes relative to others;
- It was very challenging to deal with competing views from different stakeholders and to come to a consensual final agreement. The government took responsibility for finalizing the plan and pushing it through to the next stages, including review by Parliament.

To this day, contacts within the industry are still active and the process is considered good practice. There is also an annual report covering progress on GHG targets to assess how successful the project is in meeting its targets.

The main priority for NRW going forward is to find a way to work with industry and utilities in a constructive way, maintaining a dialogue and encouraging them to act voluntarily.

A major conclusion from the CPP was that there is a need for more R&D over the coming years, as current technologies will not be sufficient to reach mid- and long-term targets. To deliver on the R&D needs, NRW started to work on a Low Carbon Innovation Center to discuss decarbonization pathways for the industry up to 2050, including innovative technologies, cross-innovation between different branches and policy frameworks necessary to achieve the required GHG savings. However, differences in the priorities of partners and disagreement around the initial idea to ask the industry partners to fund the Center has resulted in a number of partners dropping out of the program. The government is trying to address this challenge by engaging more stakeholders and finding a new funding approach.

Beyond this, NRW has identified that the government can play a role in creating cross-sectoral linkages for new and innovative technologies, such as carbon capture and utilization and the use of hydrogen for steel manufacturing.

## Wales, UK

Manufacturing and heavy industry in Wales has been declining in recent decades but still forms a significant part of the economy. The main industrial sectors include steel, cement and oil refining.

To date, the Welsh Government's engagement with industry on decarbonization matters has largely taken place on a case-by-case or project basis. This ad-hoc approach has been relatively successful; however, current ways of dealing with the industry (mainly through financial support, such as through the Environmental Protection Scheme discussed below) are proving to be unsustainable in the long-term. Thus, there is a need to develop a strategic approach and comprehensive program to make sure that funding is allocated cost-efficiently.

The major energy users are 'anchor companies'- significant employers in the region - and hence have direct channels of communication with the Welsh Government. Many of the industrial sites in Wales are owned by multi-national companies which operate competition between sites to drive efficiencies. As a result, the conversations between the government and these industries are often focused on economic pressure, including supporting jobs and lowering energy prices, and not specifically on decarbonization. Although industry is not reluctant to discuss energy efficiency and decarbonization, to introduce policy to transition to a low carbon future it is essential for the government to support industries with their most pressing issues, in order to protect against carbon and jobs leakage.

Target industries so far have been large industries - there are a few very large emitters in Wales, so the government can interact with each individually (16 installations represent over 40% of the country's emissions). However, there is a lot of untapped potential in higher-end SMEs, which together represent a big share of emissions but are resource-intensive to deal with.

**Case study – Environmental Protection Scheme**

The Environmental Protection Scheme was put in place as a way of supporting investment in improved environmental protection across Welsh industries and businesses. The scheme allows businesses to apply to the government for funding for specific environmental or decarbonization projects. However, the scheme differs from a Fund in that there is no allocated budget. Each proposal is assessed on its individual merit and funding is sourced and approved from internal government departments.

The specific aims of the scheme are to:

- Protect and enhance the environment in Wales.
- Combat climate change.
- Promote sustainable energy production.
- Promote energy and resource efficiency.
- Promote lower embodied energy in goods and services constructed, manufactured or delivered in Wales.

The current notification, which consists of 12 schedules of eligible activities (e.g. investment aid for energy efficiency measures; high-efficiency cogeneration; the promotion of energy from renewable sources; remediation of contaminated sites etc.) was launched in January 2015 and runs until 2020.

To date, aid has been awarded for nine projects. The scheme is open to all industries and companies of any size, but the projects funded to date have tended to be for large, energy intensive users such as steel, food and drink, and nickel companies. The scheme provides a means of supporting innovative and cutting-edge process improvements that provide substantial returns in terms of energy efficiency, carbon reduction or environmental protection, but that otherwise would not go ahead due to internal financial barriers such as long payback or lack of capital.

Currently, the scheme provides a non-repayable financial incentive and as a result there is a need to manage expectations and resources. A discretionary approach has been taken and projects must clearly demonstrate value for money and meet the schemes objectives. Most of the projects have been quite large (in the millions of pounds).

Challenges:
A major challenge for the scheme is that it is expensive, time intensive and requires substantial technical and legal expertise from the government. In particular, a barrier to projects going ahead is the fact that the scheme cannot be used to meet standards and permits. Thus, a large amount of resource goes into technical due diligence and ensuring that the project is legally

compliant by demonstrating that it goes beyond the standards. Projects can take between three and 18 months from time of application to approval, depending on the complexity of the application, the business case, and the ability to secure internal budget. All projects are independently reviewed and audited and those which are greater than £1 million are automatically reviewed by the Welsh Industrial Development Advisory Board.

Overall the scheme is considered successful and has been effective in meeting its goals. It has enabled the Welsh government to (1) build a successful working relationship with energy-intensive sectors over a sustained period, (2) provide support and build trust, (3) respond to innovative ideas that companies must manage their carbon footprint and/or meet voluntary carbon reduction targets, and (4) assist in making businesses more robust and resilient, thus improving job security.

Despite these positive outcomes, the scheme is too expensive, complex and resource intensive and is not sufficiently strategic in its approach and streamlined in its operation to be sustainable going forward. The government is in the process of reviewing the scheme and assessing alternatives.

The priority for the Welsh government over the next few years is to design a comprehensive policy to drive decarbonization of industry by supporting the transition within industrial sites in Wales while protecting against carbon and jobs leakage. To begin with, the government will focus on establishing a baseline from which to draw a clear engagement plan by centralizing all existing data on industry. The government wants to improve conversations with industry on driving competitiveness through innovation and low carbon technologies and improved long-term decision-making processes.

Some of the approaches that Wales is considering include:

- Negotiated agreements/voluntary targets.
- Financial support/incentives particularly for R&D.
- Guidance options to assist industries in meeting policy requirements.

## LESSONS LEARNT AND RECOMMENDATIONS

The Energy Transition Platform Innovation Lab on Engaging Industry has supported government partners to explore region-specific policy priorities and challenges, and further to identify common issues and learn from the collective experience. This section summarizes some of the overarching findings.

- **Common challenges**: The experiences of the states and regions presented in the case studies above show that these regions are facing similar challenges when trying to engage with industry. There is a tension between governments' desire to push industries to improve their energy efficiency and carbon footprint while at the same time not wanting to overburden industries with additional regulation when many companies are already facing increased economic pressures.

- **Dialogue forms**: Establishing open means of communication with industry and a level of trust is essential for successful engagement with industry. There are different ways this can be achieved. One way is to build this up over time through sustained interaction with individual companies, as in the case of Wales. This can be a highly successful approach. Alternatively, in developing their Climate Protection Plan, NRW sought to engage industry through a highly transparent, participatory and iterative multi-stakeholder approach.

- **Financial incentives**: These can be effective but the example from Minnesota also shows the limitations.

- **Regulatory barriers**: Both Wales and Minnesota found that using state aid to fund business led to unexpected hurdles to the implementation of policies. This highlights the need for governments to carry out due diligence up front to anticipate different regulatory hurdles and to develop schemes that are robust. Companies also require clear guidance and support upfront to ensure compliance.

- **Enabling conditions**: Strong political will as in the case of NRW is a key enabling condition. This allowed the government to mobilize action and to carry out a ground-breaking action plan.

- **Establishing a baseline for action**: All the regions agreed that to determine the most appropriate approach, there is a need to fully understand the current needs of industry, what has been done already and the remaining potential for improvement. NRW conducted this as part of the development of the CPP and both Wales and Minnesota are currently beginning this process.

**Author: Dr. Tamaryn Napp, Grantham Institute – Climate Change and the Environment, Imperial College London**

Resources:


1. US DoE (2014). Industrial Energy Efficiency: Designing Effective State Programs for the Industrial Sector. A report by the State and Local Energy Efficiency Action Network.
2. Worrell, E. (2003). Productivity benefits of industrial energy efficiency measures. Energy, 28, 11, 1081-1098.
3. Lung, R., Mckane, A., Leach, R. and March, D. (2005) Ancillary Savings and Production Benefits in the Evaluation of Industrial Energy Efficiency Measures. Proceedings from the ACEEE Summer Study on Energy Efficiency in Industry
4. Presentation by Stefan Lechtenböhmer on 'Platform Climate Protection and Industry North-Rhine Westphalia' presented to the ECEEE 2016 conference on the 14th September 2016, Berlin, Germany
5. Cadmus Group (2015), Aggregate Economic Impact of the Conservation Improvement Program 2008-2013. Prepared for the Minnesota Department of Commerce. COMM-20140512-87354. mn.gov/commerce-stat/pdfs/card-report-aggregate-eco-impact-cip-2008-2013.pdf