



Success and Limitations of EU and US Evaluated Energy Efficiency

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ABSTRACT

This paper assesses EU energy efficiency (EE) structures and policies compared to US EE structures and policies.

- Significant progress in deploying energy efficiency (EE) measures and projects across the US and EU
- US EE deployment is focused on energy-demand reduction, while the EU deploys EE mainly for GHG reduction
- Review of consider various evaluation approaches and policies detailed across states and national levels
- Analysis provides insights into rapidly changing EE policy and structure and the energy industry

EE STRUCTURES AND POLICIES

Global movement away from central generation and toward new energy industry business models is underway.

- **A large part of this change is due to carbon produced by coal and natural gas plants.** Many states and nations are looking to EE to reduce energy demand since EE is shown to be a least cost resource while also playing a key role in decarbonization.
- The US leverages EE mostly for energy savings reductions, reducing costs and power requirements - the EU deploys EE mainly to reduce greenhouse gas (GHG) and carbon.
- **A key difference between the EU and US on EE policy is that there is an overall EU directive to reduce GHG by 20% by 2020 and 32.5% by 2030** – each nation chooses to adopt the EU EE directive or choose an alternative policy approach.

EU STRUCTURES AND POLICIES

The EU's deployment of EE is focused on decarbonization in the power, heating, and transport sectors - EU emphasizes that reaching climate and energy goals without EE is expensive and problematic.

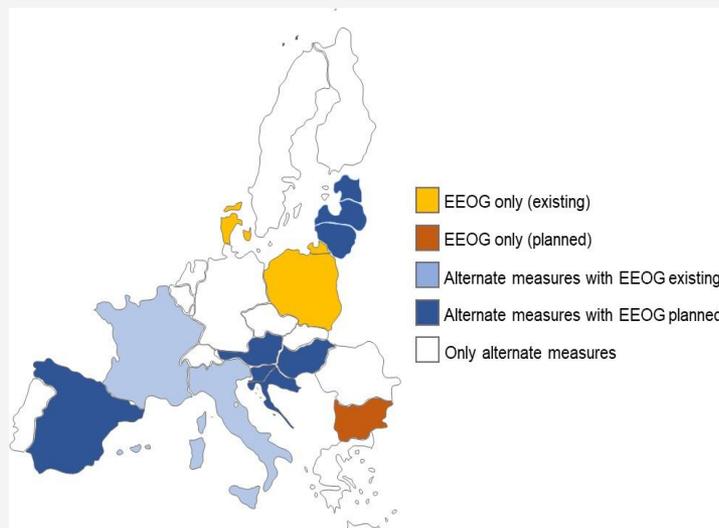
- Without EE, massive renewables are required
- EE is widely seen as a least cost resource - as of 2019, the EU will have to decrease energy use by approximately 17% by 2030 compared to 2015 levels.
- In the EU, it's planned that energy use will have to decrease by one third or more by 2050 to achieve its decarbonization goals.
- EE is seen as a key strategy in ensuring the cost-effective decarbonization of the energy system - electrification can only be limited by reducing overall energy demand in buildings, industrial and transport sectors and increasing efficiencies of appliances.

EU STRUCTURES AND POLICIES

EE Obligation Schemes (EEOS) are central to the EE Directive (EED) – results have already been achieved in the EU.

- The EED has led to increased EEOS across the EU member states (MS)
- 17 MS are implementing an obligation scheme and 40% of the proposed savings from Article 7 of the EED will be generated by EEOS, making EEOS by far the most important policy instrument in terms of energy savings.

Map of MS with Existing and Planned EEOS



Source: Study Evaluating the National Policy Measures and Methodologies to Implement Article 7 of the EED at p. 16

EU STRUCTURES AND POLICIES

EEOS are planned by 11 MS and have already been implemented by 6 MS. Of these 17 MS, 11 MS have not begun implementing EEOS (i.e., Austria, Bulgaria, Croatia, Estonia, Hungary, Latvia, Lithuania, Luxembourg, Malta, Slovenia and Spain).

EU Member States EE Goals to meet Article 7 Goals as of 2019

Member State	Cumulative Energy Savings Target (ktoe)*	% of Exemptions Used (Article 7.2)
Austria	5,200	25%
Belgium	6,922	25%
Bulgaria	1,943	25%
Croatia	1,295	25%
Cyprus	242	25%
Czech Republic	4,581	25%
Denmark	4,130	3%
Estonia	611	25%
Finland	4,192	25%
France	30,570	25%
Germany	41,989	25%
Greece	3,301	25%
Hungary	3,614**	25%
Ireland	2,164	25%
Italy	25,502	25%
Latvia	851	25%
Lithuania	1,004	25%
Luxembourg	532	25%
Malta	56	25%
Netherlands	11,512	25%
Poland	14,818	25%
Portugal	3,376	0%
Romania***	10,000	Not Clear
Slovakia	2,284	25%
Slovenia	945	25%
Spain	15,979	25%
Sweden	9,114	21%
UK	27,859	25%
TOTAL	234,575	-

US STRUCTURES AND POLICIES

EE is implemented across many US states with goals and standards: six states have EE goals, 24 states and DC have legislated EE resource standards and 7 states have adopted or extended EE policies since 2016.

- **No national US energy policy or legislation exists that is comparable to the broad EU Article 7 EE directives.**
- US energy policy does have broad stroke national laws such as the Public Utility Holding Company Act of 1935 (facilitates regulation of electric utilities)

There is no overriding US federal law that guides energy use and conservation and no national laws that mandate meeting demand or GHG reduction by certain dates like those in the EU - This is especially true for EE national goals or standards.

US STRUCTURES AND POLICIES

A nationwide map of EE structures reveals a patchwork of laws and policies.

Map of US States with EE Goals or Standards



Source: EIA State Adoption of EE Policies - 2017

US STRUCTURES AND POLICIES

Each state establishes its own regulatory structure for implementing EE. Only 30 states have some type of established EE goals. Utilities in other states offer EE programs, but they are not required by law or regulation.

- States have established various initiatives to promote the development of EE programs. Legislative and regulatory oversight varies greatly by state. Many states have degrees of EE legislative or regulatory policy activity.
- But the level of specific requirements, length of EE in each state and the types of incentives and penalties varies across states.
- EE regulatory financial paradigms are typically designed around cost recovery, lost margin recovery and performance incentives.

EVALUATION APPROACHES IN THE US AND EU

Both the EU and US EE evaluation include approaches for EM&V and reported savings. Evaluation approaches are focused on ensuring cost-effective EE programs that meet regulatory requirements.

- Verifying gross savings to be applied toward regulatory goals each program year
- Deemed savings values from technical resource manuals or other sources
- Impact evaluation involving data collection, analysis and creating recommendations
- Technical reviews and gathering state-specific data to update savings calculations
- Process evaluations for programs or EE research efforts to improve EE programs

US evaluation is implemented at the state level with advances over the last 30 years. The US has more than three decades of EE programs implemented and delivered by utilities, funded with ratepayer dollars and have resulted in widespread implementation of EM&V, developed locally and vetted nationally.

EVALUATION APPROACHES IN THE US AND EU

EU evaluation is strong, but possibly not as rigorous as many US states that have implemented and evaluated EE over many years.

- EM&V methodologies are not uniform across the EU and MS are free to develop their own EM&V protocols, baselines, and methodologies for estimating energy savings.
- EM&V in the EU is driven mainly by requirements to estimate energy savings achieved by energy suppliers subject to EE MS obligations.
- Stringent EM&V is likely to increase as MS respond to the 2012 EE Article 7 EED requirements and implement EEOS or alternative EE plans that deliver 1.5% energy savings each year.
- Effort has gone into creating deemed energy savings values for numerous EE measures.

EE APPROACHES IN THE US AND EU

Which is better?

US EE

- The US effectively deploys EE across numerous states, but not all states, and broad nationwide EE adoption is limited by each state's internal policies, local interest or lack of interest in reducing energy consumption.
- Many states have limited, or no EE savings goals or standards which are focused on reducing energy demand and use, not carbon or GHG reduction.

EU EE

- In comparison, the EU is focused on reducing energy use and waste and reducing GHG and carbon levels - this is of growing importance in the EU.
 - EU 2007 targets were set to cut annual energy consumption by 20% by 2020 - this was further expanded to **32.5%** by 2030.
 - These goals are mandated across all the EU states, there is a unified approach with rules that allow each MS to implement plans to reach individual MS goals. The goals appear to be working. EE measures are used to achieve energy supply needs, cut GHG, and promote EU economic competitiveness.

CONCLUSION

EU and US Similarity

- In both the EU and the US, there is industry movement away from central station generation and toward EE and renewables. At the core of this industry shift are the dual goals of reducing energy demand and lowering carbon through GHG reduction.

Difference

- US leverages EE mostly for demand reduction through energy savings - EU leverages deployed EE mainly to reduce GHG and carbon emissions.

Key Difference

- A key distinguishing factor between the EU and US is how EE is deployed – in the US it's mandated and evaluated state-by-state, while in the EU, Article 7 mandates an EU-wide savings goal.

CONCLUSION

US Benefits

Both approaches have their merits. The US approach allows for states to control how energy is managed within its borders.

EU Benefits

The EU Article 7 Directive mandates an EU goal and allows each nation to work within Article 7's parameters to reach their individual goal.

Looking Forward

- The glaring absence of US national energy policy to reduce energy demand or GHG is a key difference between the continents.
- Conversely, the EU can learn quite a bit from the US's more stringent and established EM&V oversight – this will likely occur as MS Article 7 goals need to be measured over the next decade.
- In addition, EULs should also be applied for counting EE savings across multiple years (cumulative years) and requiring multiple year saving goals.

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