

## EUROPEAN UNION

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**Renewable Energy: Case Studies**Introduction

EU countries have pursued a wide range of strategies aimed at boosting the generation of energy from renewable sources. A variety of political and other contextual factors have motivated individual policy choices, but many of the lessons of policy outcomes in Europe are relevant to the debate about energy policies in the U.S. The experiences of Germany, the United Kingdom, and Denmark are of particular interest to the campaign to introduce Feed-in Tariff (FIT) policies in the U.S.

Germany

**Summary:** Germany adopted the first successful FIT policy in Europe (Lauber, 1406). This policy has undergone one major overhaul and periodic refinements that draw attention to the potential pitfalls of specific FIT provisions.

**Policy Development:** The first German FIT, the *Stromeinspeisegesetz* (StrEG), was passed in October 1990 at a time of heightened public concern about the emerging consensus on global warming and alarm about nuclear power in the wake of Chernobyl. The ruling parties presented the StrEG as an internalization of the external costs of nonrenewable energy (RE) rather than as a subsidy (Lauber, 1406). While its impact on wind industry growth was powerful and immediate, the StrEG became subject to intensifying opposition from utilities and the European Commission in the late 1990's (Lauber, 1407). The *Erneuerbare Energien Gesetz* (EEG), passed in 2001 by a government that included the Green Party, alleviated many of the flaws in the StrEG and contributed to Germany's continued global preeminence in the RE industry (Lauber, 1407; L, 5488).

**Policy Lessons:** The overhaul of the unpopular features of the StrEG has implications for FIT policy design in America.

- *Fixed vs. Variable Rates:* Under the StrEG, tariffs paid to generators were set at 90% of final consumer price. Generators therefore became subject to electricity price volatility following market liberalization. Under EEG, tariffs are fixed (Lauber, 1406-7; Mitchell et al., 6).
- *Declining Rates:* The cost of wind energy declined substantially under the StrEG, but consumers did not realize any savings. Under EEG, rates decline on a fixed schedule and are periodically revised to reflect technological change (Lauber, 1406-7; L, 5488).
- *Cost Sharing:* The StrEG became burdensome to customers in areas where exploitation of RE was concentrated. Under the EEG, FIT costs are socialized across all electricity customers (Mitchell et al., 9-10).
- *Technological Differentiation:* Under the EEG, tariffs vary based on technology and location. This assures a market for emerging technologies (e.g. photovoltaic), while lowering the cost of mature ones (e.g. wind) (Lauber, 1406-7).

## RESEARCH SUMMARY BRIEF

- *Utility-Owned Facilities:* Utilities opposed the StrEG in part because it excluded public and utility-owned facilities from FIT compensation. This exclusion was revoked by the EEG (Lauber, 1406-7).

**Conclusion:** The EEG blunted opposition to FITs by extending benefits to a broader array of stakeholders, while reducing the costs to certain customers and utilities. Between 1990 and 2006, the growth of RE has created 214,000 jobs and avoided 97 million tons of CO<sub>2</sub> emissions (“Feed in...”). The survival of Germany’s FIT policy must be attributed to its popularity and the advocacy coalition its success encouraged rather than to the support of any government or political party (Lipp, 5489).

### The United Kingdom (UK)

**Summary:** The UK was the first EU member state to adopt a renewable portfolio standard (RPS) that utilities can meet through the purchase of tradable renewable energy certificates (RECs). The weakness of this policy can be attributed in part to external political factors but is nevertheless a warning to US states adopting RPS.

**Policy Details:** The Renewables Obligation (RO) law passed in 2002 set annual targets for RE production, which escalate to 10% by 2010. Utilities can meet targets through the purchase of RECs from qualified RE generators or through a buyout. The buyout price serves as a cap on the cost burden of RE; however, the buyout fund is distributed to holders of RECs to serve as an additional incentive (Mitchell et al., 10-12).

**Political Context:** The UK, endowed with abundant coal and hydrocarbon resources, has long been a laggard in the development of RE in the EU. The need to reduce carbon emissions has provoked interest in renewables, but the British public views nuclear as a more viable solution. Politicians viewed the RO as a cost-efficient way to develop RE (Lipp, 5489-90).

**Policy Lessons:** Under the RO, targets have not been met, costs have remained relatively high, and only a limited number of companies and technologies have benefitted (Lipp, 5490). Some flaws in this policy should serve as a warning to the US.

- *Investment Security:* Because the long-term price of RECs is uncertain, utilities have been reluctant to sign long-term contracts with RE generators (Lipp, 5489). Only large, integrated companies have proved able to overcome the resulting price and volume risks (Mitchell et al., 17).
- *Perverse Incentives:* In an RPS scheme, the value of RECs is inversely related to the overall level of RE generation. This provides an incentive for RE generators to restrict overall supply (Mitchell et al., 20). There is evidence that some have acted on this incentive (Lipp, 5490).
- *Technological Differentiation:* The intention of the RO was to “pick no winners” among RE technologies. In fact, the RO tilts the playing field in favor of mature technologies while providing no support for emerging technologies (Lipp, 5489).

### Denmark

**Summary:** Denmark has been committed to the development of RE for more than thirty years. The literature on Danish energy policy is a valuable resource for various reasons.

## RESEARCH SUMMARY BRIEF

- *Sustained Political Commitment*: While other countries abandoned RE after the oil crisis of the 1970s, Denmark has maintained its push for energy security and self sufficiency and has developed comprehensive energy plans since 1976 (Lipp, 5486).
- *Multi-Faceted Policy Approach*: Denmark's FIT, adopted in 1993, has been complemented by various subsidies and tax incentives, including a carbon tax (Lipp, 5486; EREC, 6).
- *Political Backlash to FITs*: The success of Denmark's wind FIT hastened its own demise; as wind energy's share increased, the cost burden of the FIT intensified (Lauber, 1408-9). A neoliberal government abandoned the policy in 2001, and wind farms built after 2004 receive only a small environmental premium rather than a fixed price (EREC, 4). This policy shift has contributed to a sharp decline in new generation.

## RESEARCH SUMMARY BRIEF

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