

MISSION STATEMENT

CFEE Study Travel Project – *The United Kingdom, Finland, & Ireland*

October 2017

In October 2017, the California Foundation on the Environment and the Economy (CFEE) is leading a delegation of California State Legislators, environmental and labor leaders as well as senior executives from California's major corporations to the United Kingdom, Finland, and Ireland. The delegation will meet with political leaders, regulatory authorities, transportation agencies, industry leaders, urban planners, and environmental experts. The mission of the study travel project is to explore best practices and advanced technologies in energy and transportation policy—all of which have direct application for California.

DECARBONIZING THE ENERGY GRID

A major component of California's climate policy is to decarbonize the energy sector. This is being done in part by requiring that 50% of electrical generation comes from renewable resources by 2030 (in addition to significantly improving energy efficiency). As more wind and solar power are introduced to the energy grid, however, grid operators need additional flexibility to smoothly manage higher penetration of variable renewables. This becomes even more crucial given that the Legislature is considering substantially increasing the renewable mandate beyond 50%.

While this is occurring, California's energy system is changing in other important ways. Distributed energy resources (DER) and the proliferation of community choice aggregation (CCA's) are challenging the status quo in which a few large investor-owned utilities (IOU's) serve the majority of the load. This diversification of resource procurement has many stakeholders wondering how compatible this new democratized system is with long-term planning and decarbonization goals.

The CFEE delegation will travel to Ireland and the United Kingdom to learn what strategies they've employed to successfully integrate renewable energy and distributed energy resources with competitive wholesale and retail electricity markets, and how those markets interact with climate policies.

Renewable Integration – Ireland and Wales

Ireland is seeking to generate 40% of its electricity from clean power resources by 2020. Currently, over 80% of Irish renewable electrical generation comes from wind turbines. The variability of wind power requires grid operators to carefully manage this electricity to assure its successful incorporation into the energy system. Ireland has done this by developing a world-class smart grid, leveraging electric vehicle infrastructure, and forming new market mechanisms to improve system flexibility.

Wales provides an important example of how to maximize the benefit of variable renewable energy. The delegation will visit a pumped storage site in Wales (“Dinorwig”) that acts as a strategically important grid resource by storing excess energy at times of low demand and releasing it later at times of higher demand. Future pumped storage projects will feature additional capabilities, including “adjustable speed turbines,” that provide greater flexibility and speed for grid managers seeking to manage intermittently available energy supplies.

Retail Choice – England

England has a competitive electrical market that allows customers to choose their energy provider. Although the “Big Six” energy suppliers serve almost 90% of UK load, there are over 40 electrical suppliers that compete in the retail market. While this model co-exists with state-driven efforts to decarbonize the grid, questions remain whether this co-existence is mutually beneficial. CFE’s fundamental questions are: has retail choice supported, inhibited, or been indifferent to the UK’s climate policies? How is the long-term planning for both the distribution and transmission systems (necessary to decarbonize the grid) occurring? Are they achieving levels of energy efficiency and renewables comparable to or greater than California?

TACKLING TRAFFIC WHILE CURBING CARBON POLLUTION

In 2016, two California cities ranked at the top of the most congested cities in the world. Ranking first was the City of Los Angeles where the average Angeleno annually spends 104 hours caught in traffic during peak hours and loses thousands of dollars in productivity and fuel. For its part, the City of San Francisco ranks fourth globally in congested cities, with residents losing 83 hours each year stuck in gridlock. There is no expectation that this will improve in the coming century as metropolitan populations are projected to climb.

Beyond the local effects this has for urban productivity, air pollution, and stress on already underfunded roadways, a congested transportation system also has the broader impact of slowing the movement of goods and services as well as increasing carbon emissions. In fact, transportation is the number one source of carbon pollution in California, lending urgency to the need to find workable alternatives. The delegation will meet with experts in the United Kingdom and Scandinavia to learn how they’ve begun alleviating roadway overcrowding.

Congestion Management Pricing – England

London tackled this problem in 2003 through the implementation of congestion management pricing. By assessing charges for vehicle usage in certain areas, the program aimed to decrease congestion while raising revenues for future reinvestment in the transportation system. In the intervening 10 years, the program decreased traffic levels in the charging zone by 10%, cut greenhouse gas emissions 16%, and raised over \$300 million each year. Traffic fatalities are down, air quality and public health have improved, and the program enjoys strong public support. Following London’s success, Stockholm and other cities introduced their own congestion pricing schemes. How were

these programs implemented, what was the response from residents, and has the program's initial success continued and been replicated elsewhere? Can these programs find relevance in congested California, helping to ease traffic conditions and contribute to meeting our ambitious climate goals?

Becoming a Multi-Modal Society - Finland

Finland has become a testing ground for redefining the personal mobility paradigm. In the capital Helsinki, they are moving forward with plans to utilize smart phone apps and real-time arrival information to connect travelers with various forms of transportation at the push of a button. The goal is to provide all residents with access to this "on-demand" platform in which mobility is transformed into a service, rather than an asset. Rideshare vehicles, flexibly-routed, on-demand shuttles, as well as public transportation will be made seamlessly available to travelers. In doing so, the Finnish aim to achieve a more efficient allocation of mobility resources, making car ownership a choice, rather than a necessity.



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