

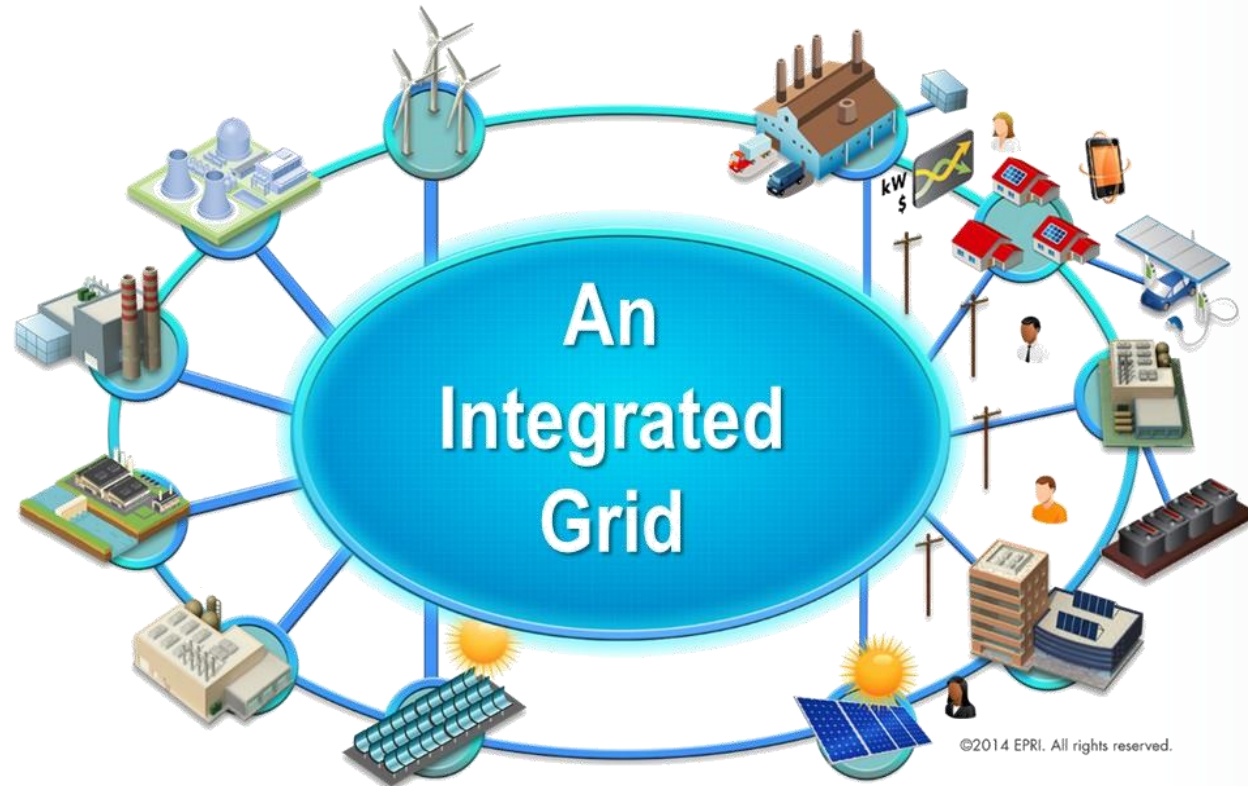
The Role of Electric Transportation in the Integrated Grid

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The Vision – An Integrated Grid



Integration of:
Electricity,
Telecommunications,
and Customer Local
Energy Networks

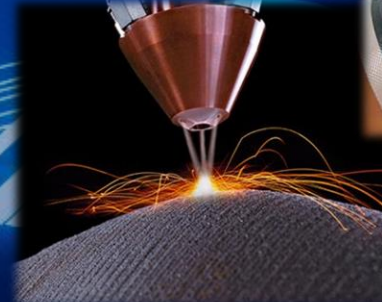
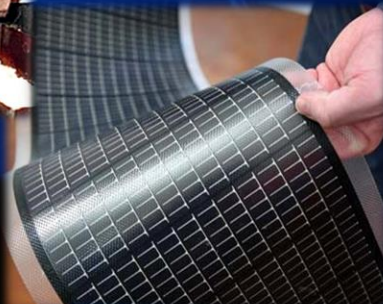
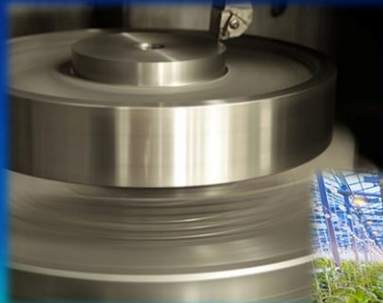
The Integrated Grid makes *Local Energy Optimization*
Part of *Global Energy Optimization*

Efficient Electrification – part of the integrated grid

Mobility

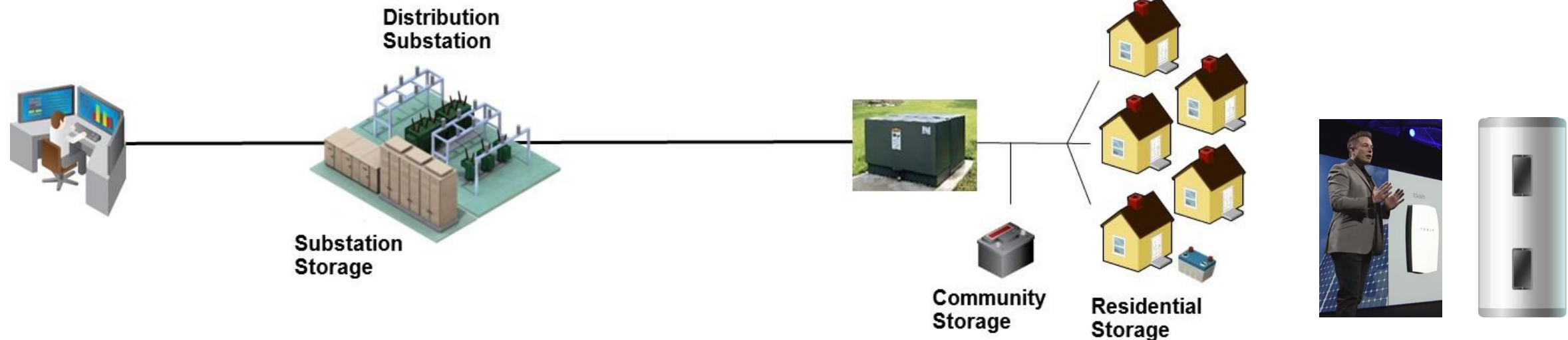
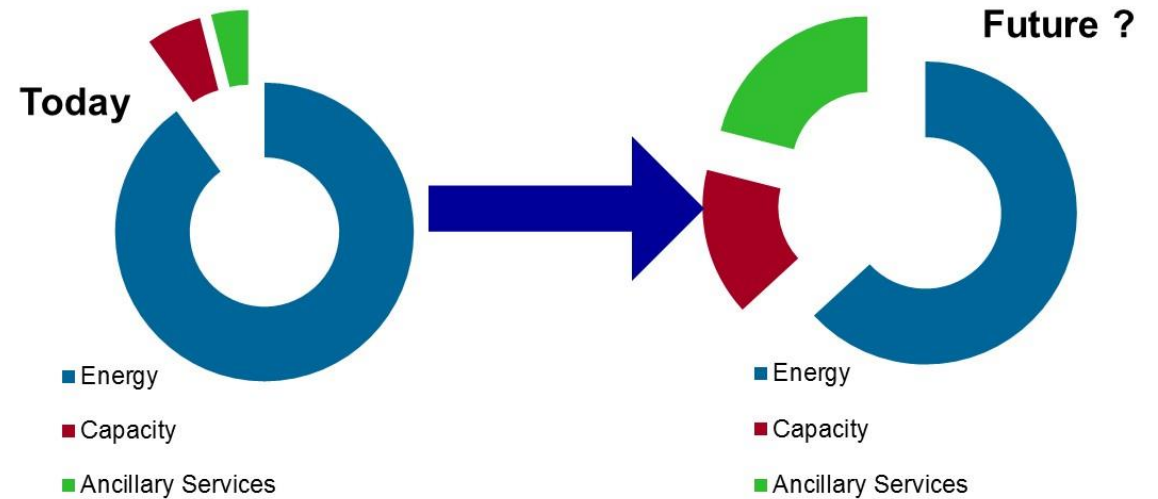
Heating and Cooling

New Applications

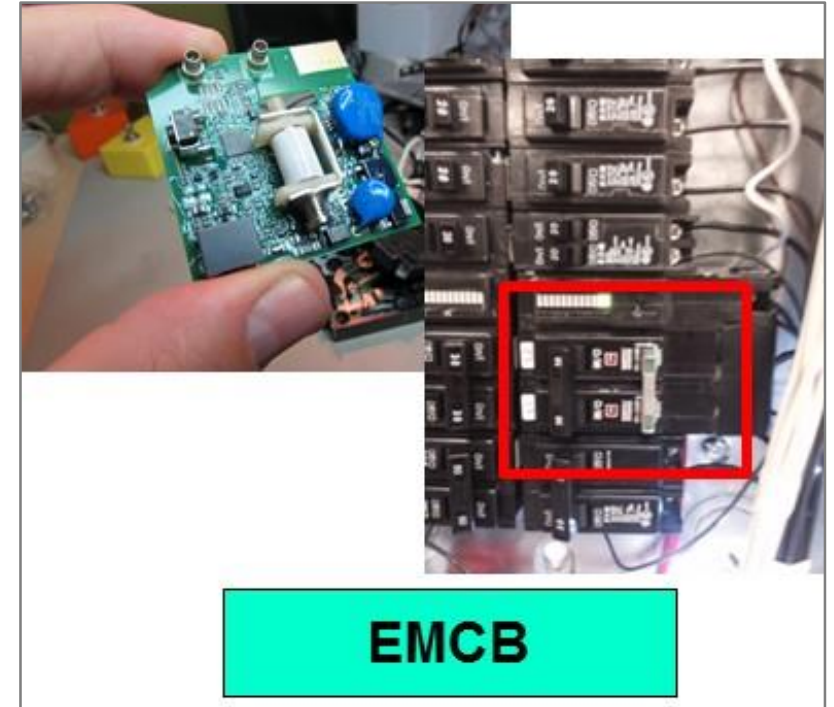


Electrification (including transportation) becomes part of the grid modernization challenge

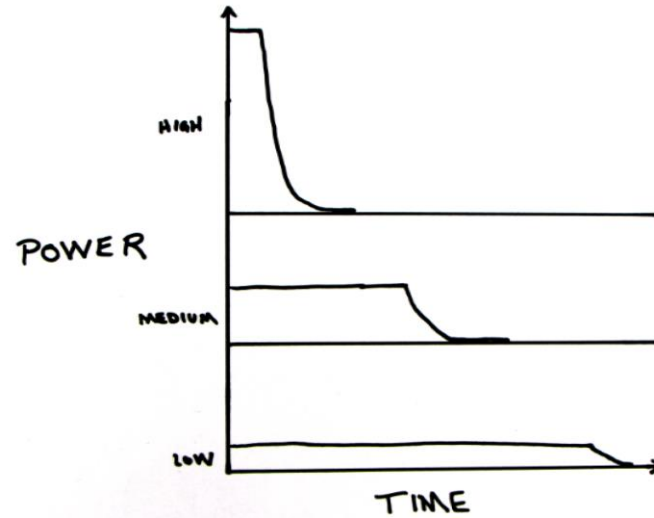
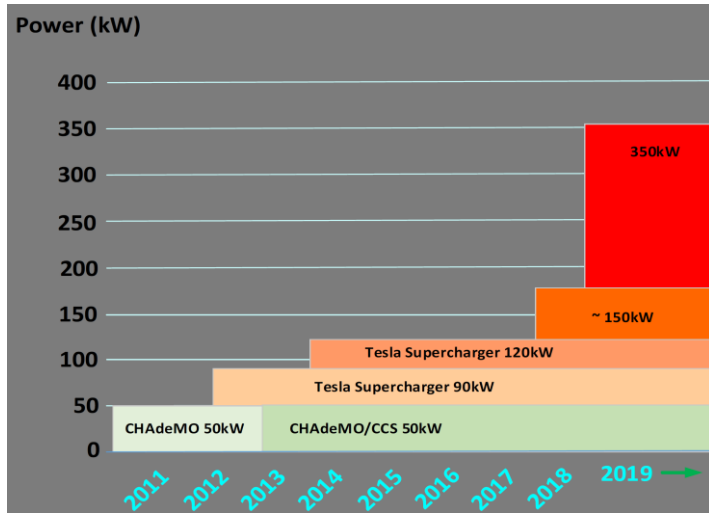
- Planning models
- Flexibility and capacity resources
- Non wires solutions
- Integrating efficient electrification
- Tariff Structures/Market Design



Making every customer part of the solution

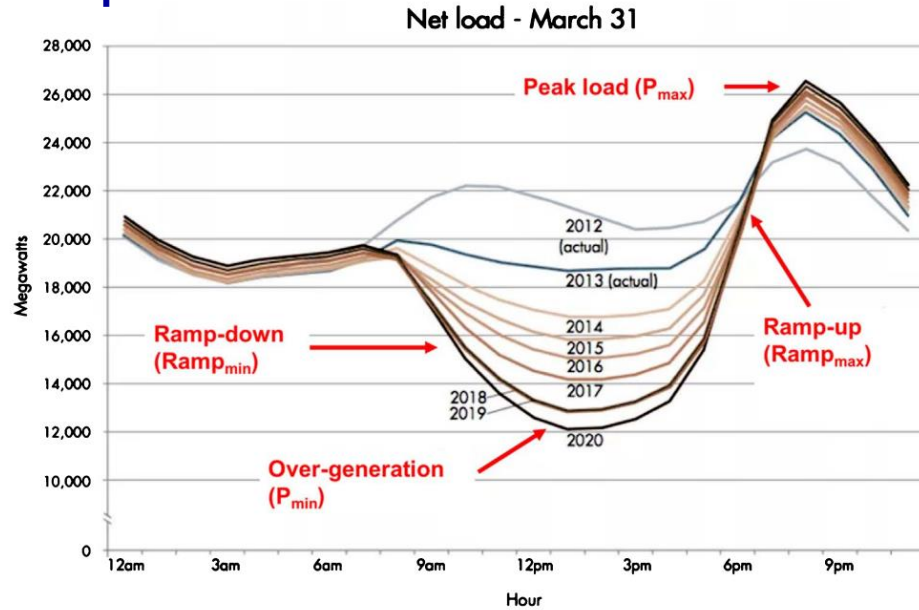


Getting Flexibility from Electric Vehicle Charging



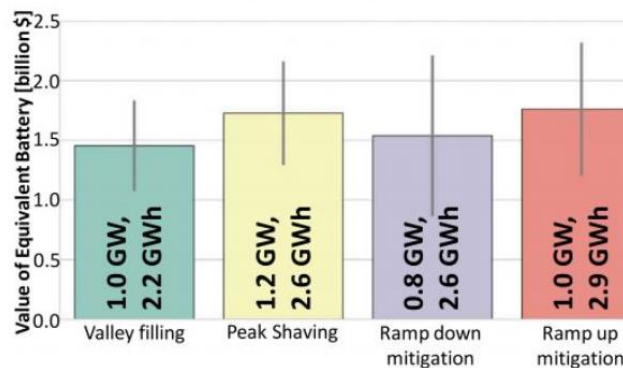
California

The problem -

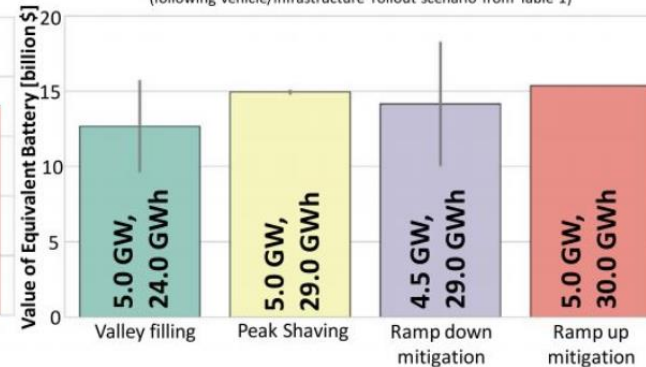


A scenario for electric vehicle charging participation in flexibility needs (2025)

a) Equivalent battery for V1G-only vehicles



b) Equivalent battery for V1G and V2G vehicles (following vehicle/infrastructure rollout scenario from Table 1)



Utility investment in charging infrastructure

	SDG&E	SCE	PG&E
Program Name	Power Your Drive	Charge-Ready	EV Charge Network
Scope	3,500 charging stations	1,500 charging stations	7,500 charging stations
Budget	\$45M	\$22M	\$130M
Markets	Multifamily and workplaces	Multifamily, workplaces, and public	Multifamily and workplaces
Disadvantaged Communities	≥ 10% charging stations in disadvantaged communities	≥ 10% charging stations in disadvantaged communities	≥ 15% charging stations in disadvantaged communities
Program Start Date	Expected mid-2017	May 27, 2016	Expected mid-2017

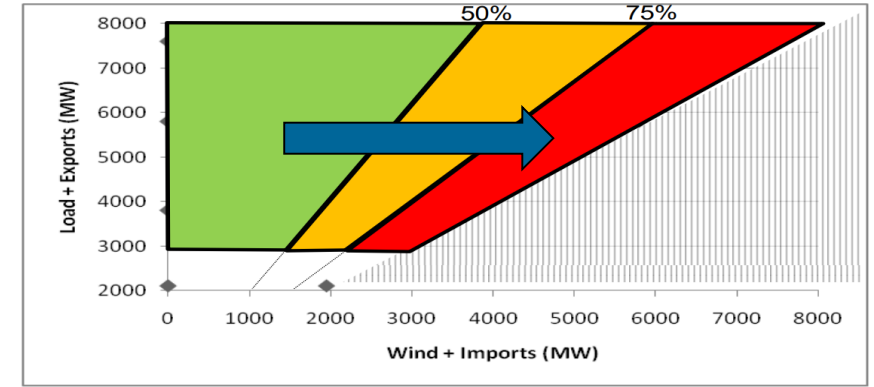
Source: CPUC

Fast charging infrastructure

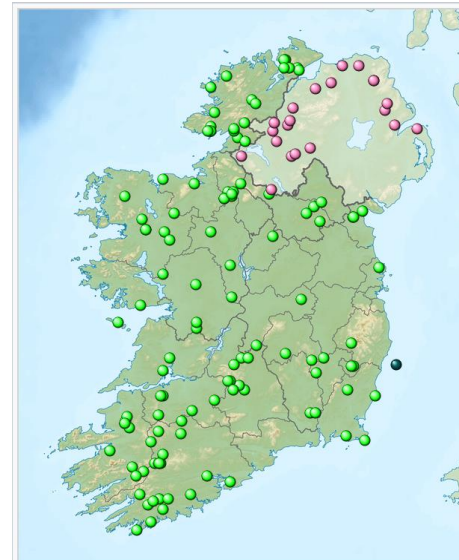
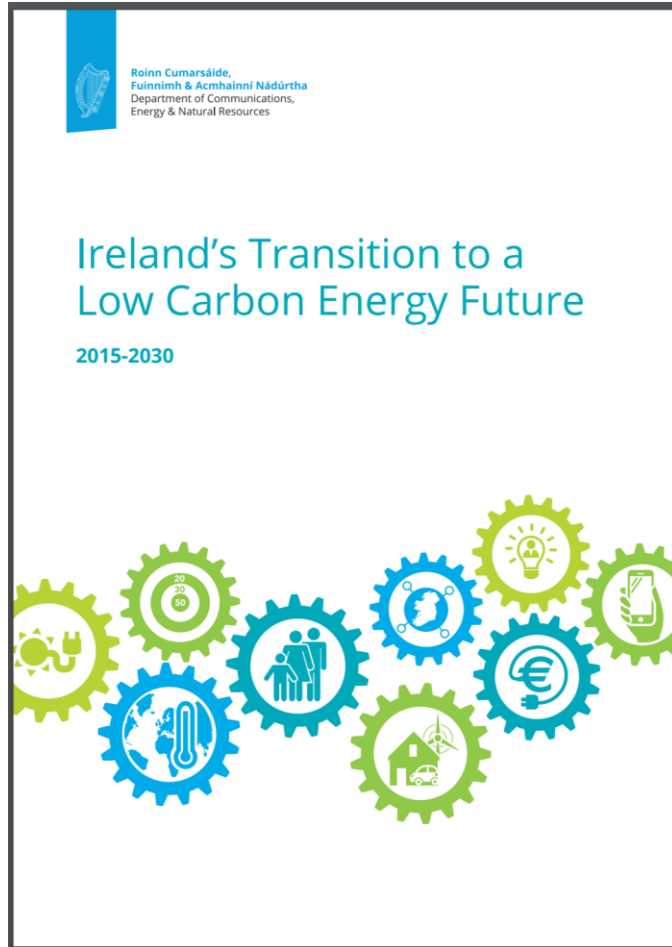


Ireland

Integrate clean energy



Ireland decarbonization strategy



Locations of wind farms on and around the island of Ireland

Produce clean energy

Use clean energy - Integrate the electrification of heat and transport





Together...Shaping the Future of Electricity