

Smart Communities

NCSL | Julia Thayne | 30 July 2018



Agenda

- Cities Center of Competence
- 3 **Challenges** Facing Cities
- Planning for **Sustainability**
- Is the **Grid** Ready? Scaling Electrification
- Where the Market Is Starting
- Mixed-Use **Developments**
- **Policy Takeaways**

Cities Center of Competence

100 Employees, 70 Cities, 6 Continents, \$4B

Large-scale Projects



Infrastructure Consulting



Strategy



Partnerships



3 Challenges Facing Cities

Sustainability



>400 city mayors have joined Climate Mayors, pledging to continue sustainability efforts in the U.S. in accordance with the Paris Climate Accord.

Resilience



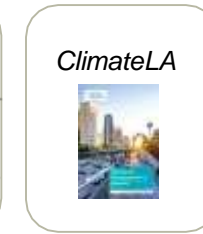
Flooding, severe storms, heat waves, draughts, hurricanes, and tornadoes cost the U.S. **>\$700B** in damages from 2004 to 2013. **Intensity, frequency, and duration of weather events** have increased.

Innovation



Cities are increasingly bidding for talent and companies. 238 cities bid for Amazon's HQ2 (50k workers, \$5B in new construction) – that's **almost 10% of all cities in the U.S.**

Pathways to City Sustainability



Target

80% GHG Emission Reduction by 2050

Technologies



100% Renewable Electricity, 50% Electric Heating



75% Commercial Buildings Automation, 30% of Homes Automated



100% eCars, Buses, BRT, 75% eHighways

Impacts



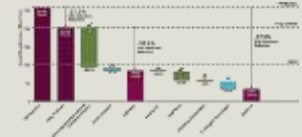
87% GHG Reduction



\$315B in CapEx and OpEx, 1.8M FTEs



Electricity Consumption: +10% in Building / +1,663% in Transportation / +30% in Heating



Investments



3.3 M Heat Pumps



400k Homes Automated



150k EVSE

Scaling Electrification

Is the Grid Ready? Infrastructure in the US Today



5.6M
Commercial
Buildings

87B
Square Feet of
Commercial
Floorspace

138M
Housing Units



7,000
Power Plants

55,000
Substations

2,000
Microgrids



26M
Streetlights

311,000
Traffic Signals

187M
cars, 935K buses,
11M trucks, 204k
airplanes, ? scooters





Trends in e-Investments Today

- Grid management, smart metering
- ■ ■ Microgrids
- Electric heating
- **Net zero developments**
- Energy efficiency (EPC)
- ■ ■ eMobility and EV charging infrastructure

■ Utility
■ Developer
■ Municipality

Mixed Use Developments



Sterling Ranch near Denver, CO

-3,400 acre development

-12k residences, 3 data centers, 2M ft² commercial space, school

-Security, street lighting, home analytics, water conservation, energy efficiency, building automation

Top Technologies & Biz Models

Electric Heat Pumps



EV Chargers



Grid Management



Planning Software



Transactive Energy



Mobile Substations



Building Automation



Digital Platforms



Managed Buildings



Energy-as-a-Service



Energy Storage



Micro Generation





Policy Implications

Digitalization and electrification have to happen hand-in-hand: Any new infrastructure project should have a digital component.

Policies aimed at **sustainable new developments** that are EV-equipped, microgrid-compatible, digitally flexible, smart design

Economic development centered on 1) **training** for jobs to program, install, operate new technologies and 2) **innovation ecosystems** for renewable electricity, energy storage, and eMobility

Procurement guidelines that enable flexibility in private-public management of projects

Contact



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