

ET Summit 2019

Presented by



Clean Energy Progress, Trends and Opportunities

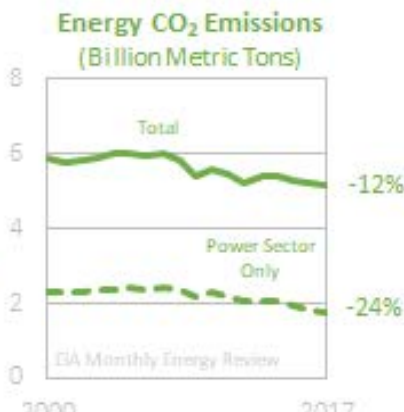
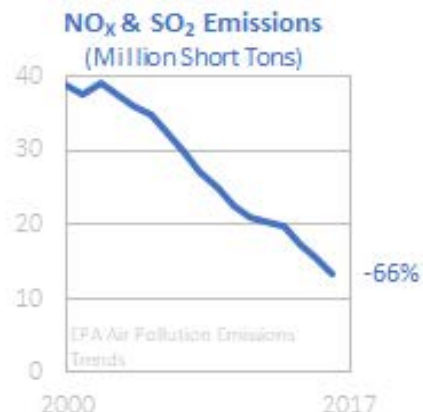
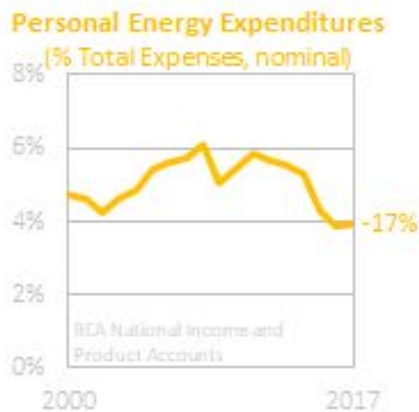
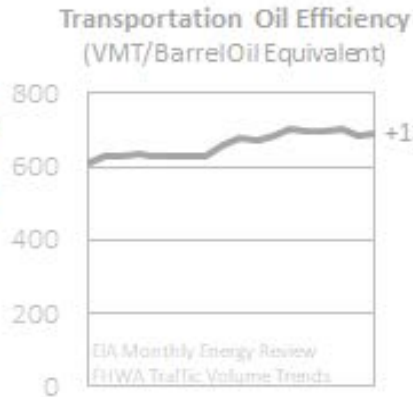
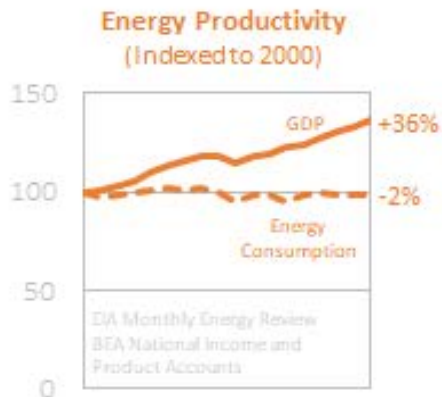
Steve Chalk

Vice President

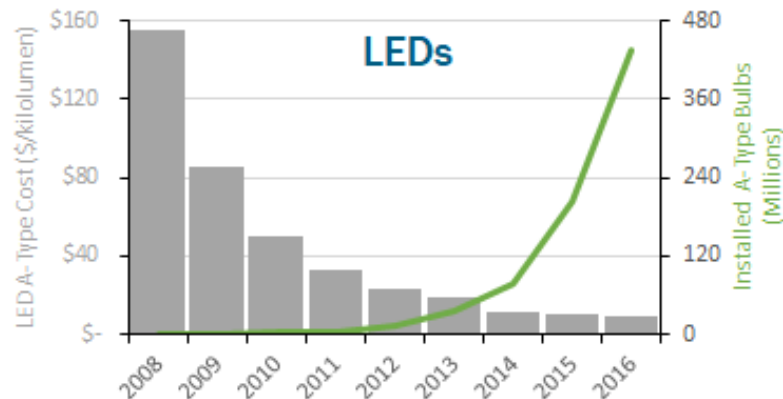
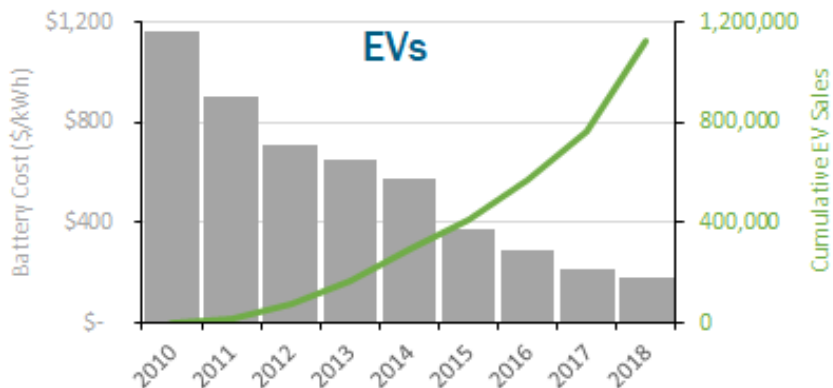
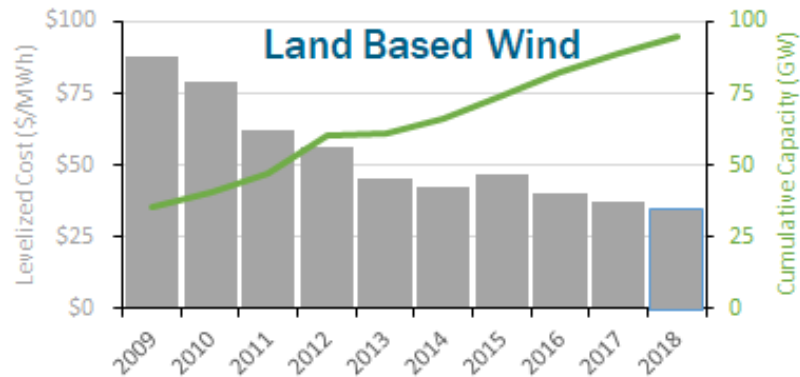
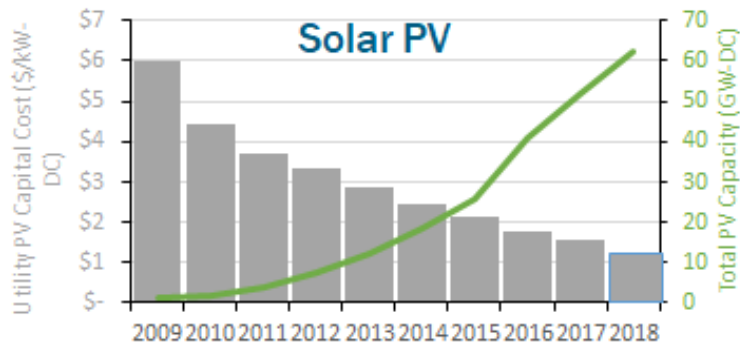
Strategic Marketing Innovations



Clean Energy Progress and Trends (2000-2017)



Technology Progress and Trends over Last Decade



Current Trends and Opportunities

Consistent with Affordable, Sustainable and Low Carbon Economy

- Cheap Energy
 - Disruption: Grid Modernization
 - EVs, Electrons to fuels (hydrogen, bio-sources, waste carbon)
 - Micro CHP, HD NG Vehicles,
- IoT + Autonomy + AI
 - Low-cost, efficient, smart manufacturing, mobility and buildings
- Low Cost Storage
 - Batteries, thermal, other
 - Holistic: greater grid flexibility even with variable generation via V2G, Grid-Interactive Efficient Buildings/Plants
- "Beyond" LCOE, increased value for Low GHG, Reliability, Resiliency

Challenges/Risks: Integration At-Scale, Cybersecurity, Domestic Manufacturing/Materials Supply Chain

Steve Chalk

Vice President

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