EFFICIENCY'S ROLE IN REBUILDING AMERICA

Chuck Hookham, PE

2017 ACEEE Energy Efficiency Finance Forum

Fairmont Chicago

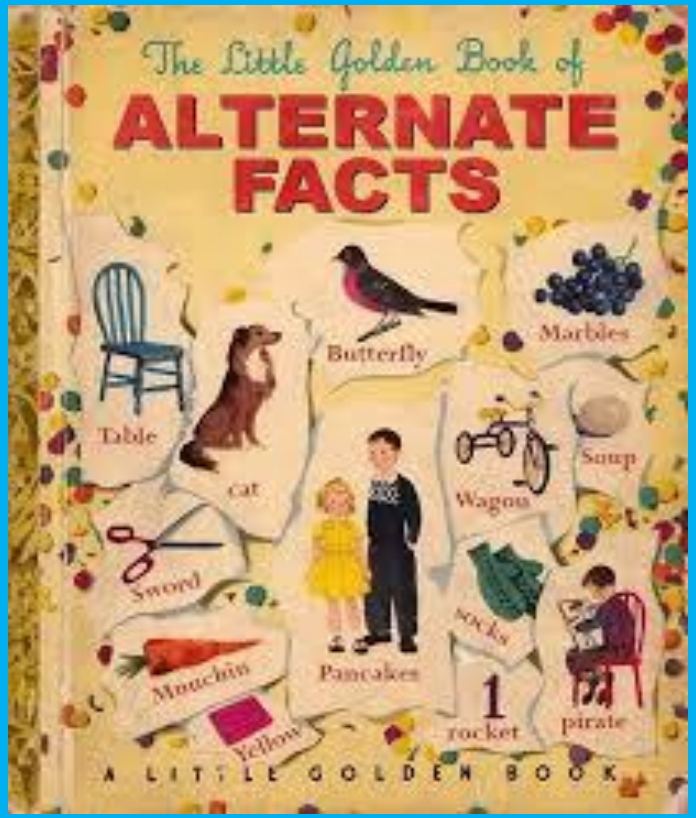
May 21 to 23, 2017

ASCE

2017

INFRASTRUCTURE REPORT CARD

ASCE Report Card “Basics”



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2017 Report Card Issue/Exposure


Committing to
Infrastructure Today for
America's Tomorrow

What the Grades Mean

EXCEPTIONAL
Fit for the future

GOOD
Adequate for now

MEDIOCRE
Requires attention

POOR
At risk

FAILING/CRITICAL
Unfit for purpose

Report Card Methodology

- CAPACITY
- OPERATION AND MAINTENANCE
- CONDITION
- PUBLIC SAFETY
- FUNDING
- RESILIENCE
- FUTURE NEED
- INNOVATION

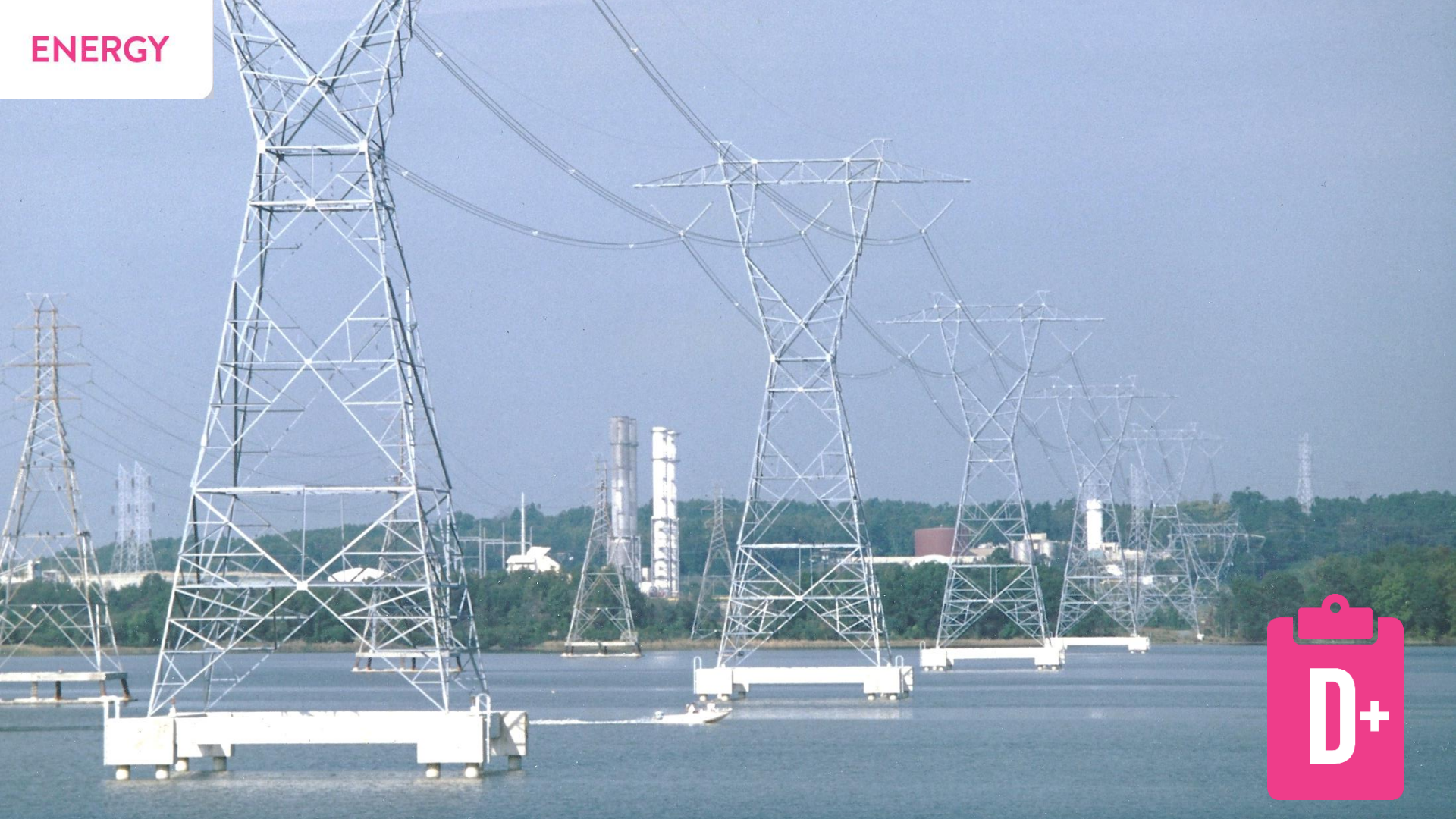
2017 Infrastructure Grades

AVIATION	D	PARKS AND RECREATION	D+
BRIDGES	C+	PORTS	C+
DAMS	D	RAIL	B
DRINKING WATER	D	ROADS	D
ENERGY	D+	SCHOOLS	D+
HAZARDOUS WASTE	D+	SOLID WASTE	C+
INLAND WATERWAYS	D	TRANSIT	D-
LEVEES	D	WASTEWATER	D+

America's Cumulative Infrastructure Grade

A	EXCEPTIONAL
B	GOOD
C	MEDIOCRE
D	POOR
F	FAILING

ENERGY



D+


ASCE
INFRASTRUCTURE
REPORT CARD
ENERGY
POWER INTERRUPTIONS ARE
IN EXCESS OF 3,500 PER YEAR

Investment Gap

Infrastructure Systems	2016–2025 (10 years) TOTAL NEEDS	ESTIMATED FUNDING	FUNDING GAP
SURFACE TRANSPORTATION	$2,042	$941	$1,101
WATER/WASTEWATER INFRASTRUCTURE	$150	$45	$105
ELECTRICITY	$934	$757	$177
AIRPORTS	$157	$115	$42
INLAND WATERWAYS & MARINE PORTS	$37	$22	$15
DAMS	$45	$5.6	$39.4
HAZARDOUS & SOLID WASTE	$7	$4	$3
LEVEES	$80	$10	$70
PUBLIC PARKS & RECREATION	$114.4	$12.1	$102.3
RAIL	$154.1	$124.7	$29.4
SCHOOLS	$870	$490	$380
TOTALS	$4,590	$2,526	$2,064

$2.0 trillion needed

FUNDING GAP | CURRENT FUNDING

FAILURE TO ACT

CLOSING THE INFRASTRUCTURE ★ INVESTMENT GAP ★ FOR AMERICA'S ECONOMIC FUTURE

COST TO THE ECONOMY	COST TO BUSINESS	COST TO WORKERS	COST TO FAMILIES
$3.9 TRILLION	$7 TRILLION	2.5 MILLION JOBS	$3,400 PER YEAR


Investment
Leadership & Planning
Preparation for the future

SOLUTIONS

Investment

Increase investment from all levels of government and the private sector **from 2. 5 percent to 3.5 percent** of U.S. Gross Domestic Product (GDP) by 2025.

Put the **"trust"** back into **"trust funds."**

Fix the Highway Trust Fund by raising the federal motor fuel tax

Authorize programs to improve specific categories of deficient infrastructure

Infrastructure owners and operators must charge, and Americans must be willing to pay, rates and fees that reflect the **true cost of using, maintaining, and improving all infrastructure**

SOLUTIONS

Leadership & Planning

Leaders from all levels of government, business, labor, and nonprofit organizations must come together to ensure **all investments are spent wisely**

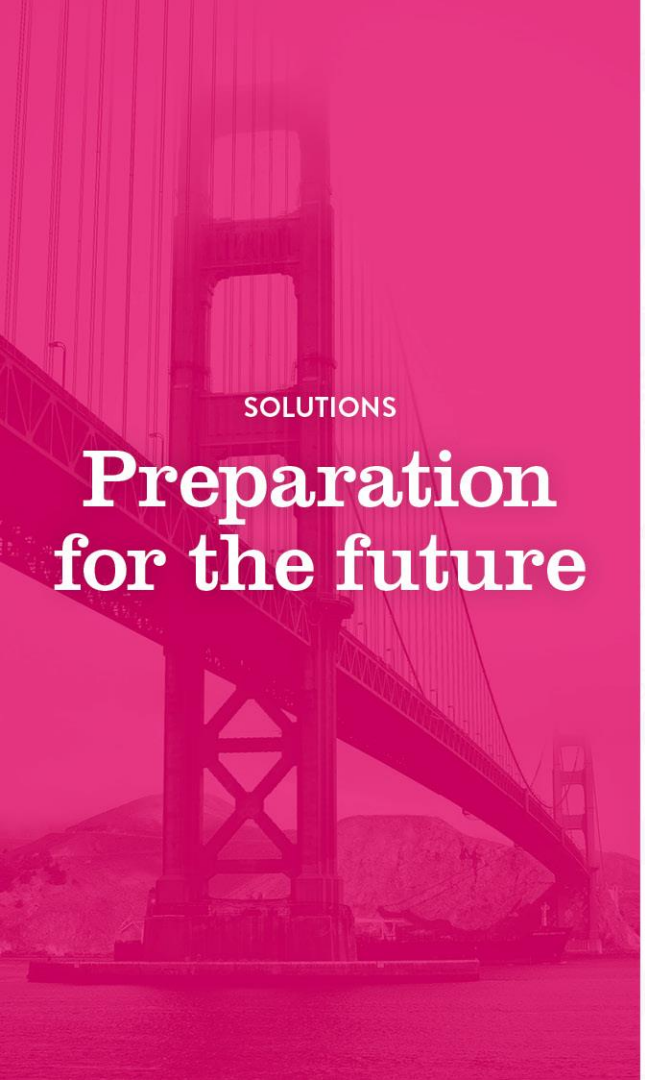
Require all projects greater than $5 million that receive federal funding use **life cycle cost analysis**

Create incentives for maintenance

Develop tools to prioritize projects

Streamline the **project permitting process**

Identify projects attractive to **private sector investment and public-private partnership**



SOLUTIONS

Preparation for the future

RE·SIL·IEN·CY *n.*
To more quickly recover from significant weather and other hazard events

SUS·TAIN·A·BIL·I·TY *n.*
Improving the "triple bottom line" with clear economic, social, and environmental benefits

Develop active **community resilience programs**

Consider **emerging technologies and shifting social and economic trends** when building new infrastructure

Improve **land use planning** at the local level

Support **research and development** into innovative new materials, technologies, and processes

Principles for Infrastructure Investment

Investments must provide **substantial, long-term benefits** to the public and the economy

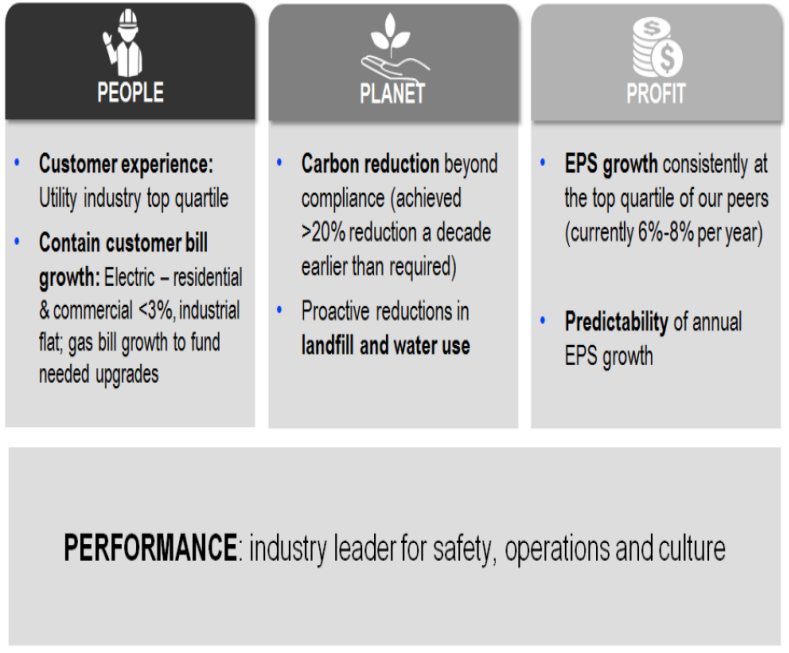
The cost of a project over its entire life span—including **designing, building, operating, and maintaining** the infrastructure—must be taken into account

Projects should be built **sustainably and resiliently**

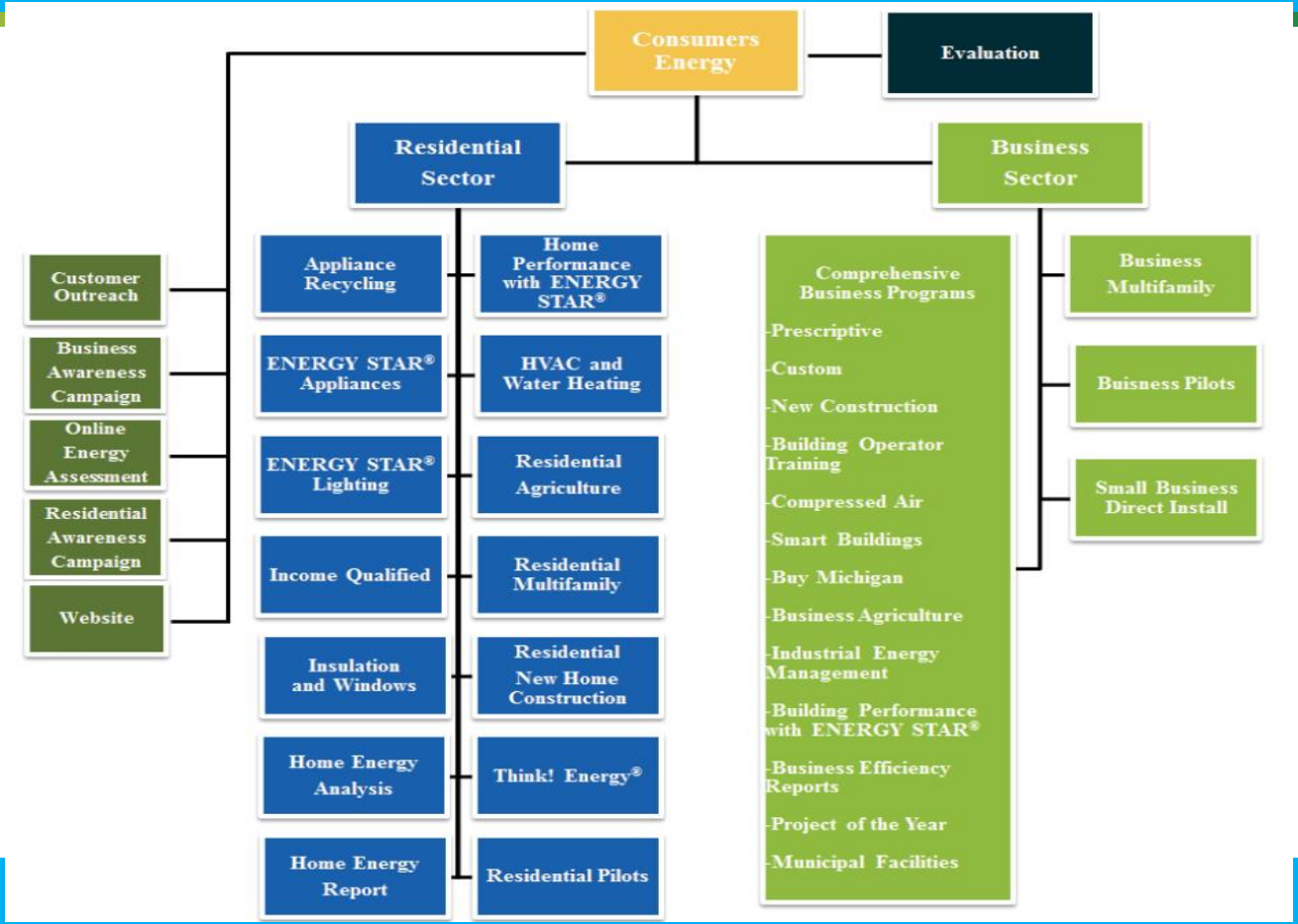
Federal investment should leverage **state, local, and private investment**, not replace these other critical sources of infrastructure funding

So Where Does Large-Scale EE Fit?

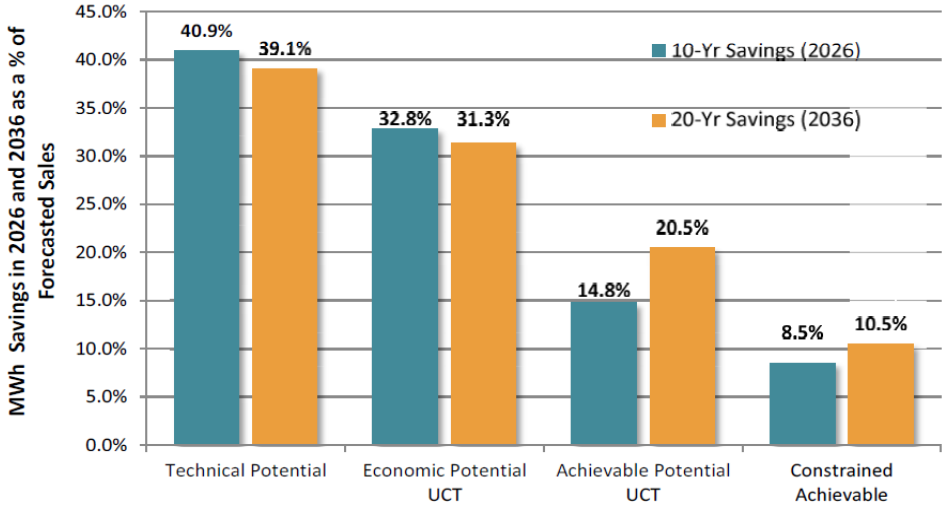
- EE reduces demand; “generation” investment shift to “T&D”, other DSM
- Recent MI storms proved smart grid investments (sensors, reclosers, DSCADA) in terms of SAIDI metrics and improved efficiency
- CEC received EPA ENERGY STAR® Partner of the Year (2015, 2016, 2017….)
- C&I, residential customers - over $1 billion saved since 2009 (energy waste reduction)
- 2017 EE Potential Study for CMS – 1% annual savings goal → increase to 1.5%
- EE investment to value – 2017 - CEC spends 95% of cap for 106% savings; 2018 savings to 150% + (robust metrics/MPSC reports)



Consumers Energy – EE Portfolio



CEC 2016/2017 EE Potential Study - Results



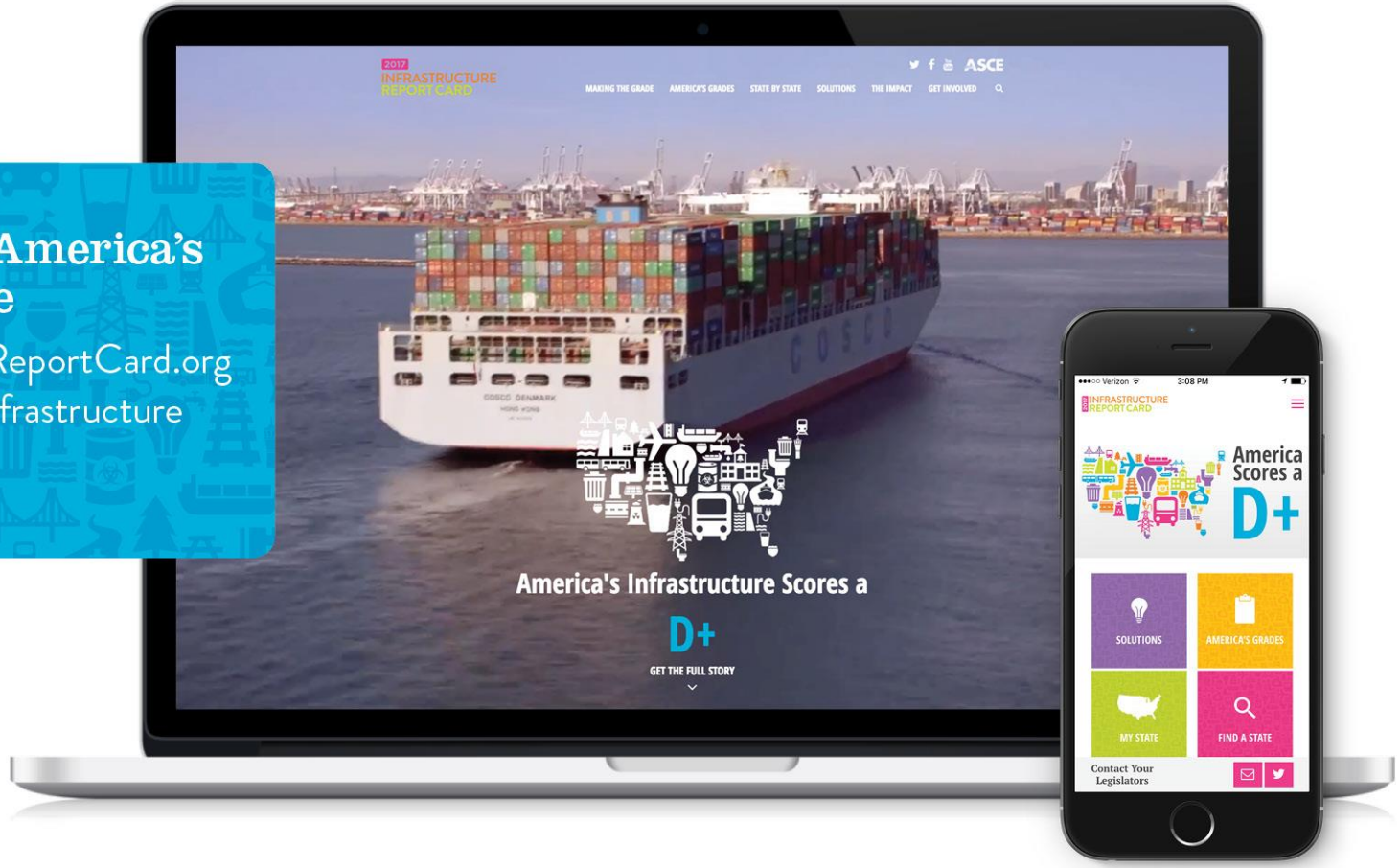
CEC ELECTRIC INVESTMENT – Year	2016	2017	2018	2019	2020	2021
Planned Investment ($)	$77.3	$78.7	$118.1	$115.4	$116.7	$118
Planned Savings (MWh)	351,811	359,328	558,260	528,556	531,672	532,376
Percent of Target	106%	107%	168%	158%	159%	158%

Local EE Outreach – Making Potential a Reality

- Local EE adoption/funding needed vs. federal or state; financing tailored to local owner
- PACE, investment banks, others can work
- City of Ann Arbor example - refocus from robust renewable energy to EE
- Advancing energy codes need adoption (e.g., MA stretch code)

Help Restore America's Infrastructure

Visit InfrastructureReportCard.org and download the Infrastructure Report Card app



Thank You

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