



AMERESCO, INC.

- Incorporated in April 2000, public in 2010 (NYSE:AMRC)
- The largest independent energy services provider with offices in North America and Europe
 - No parent company affiliations
 - Energy source neutral
 - Technology and equipment agnostic
- Comprehensive array of energy solutions
- Integrated approach – before, at, and after the meter
- Energy information platform for informed energy decisions
- Strategy and implementation partner for climate neutrality

AMERESCO
Green • Clean • Sustainable

CASE STUDY: ARIZONA STATE UNIVERSITY

Ameresco has implemented many projects at ASU over last 14 years, including:

- >17 MWdc of PV systems (47 sites) and 2 Performance Contracts
- Energy Information System database & Campus Metabolism Website
- New Central Plant, new Combined Heat and Power Plant, and many infrastructure upgrades

Resulting Energy & GHG Emissions Savings:

- 98.5 GWh/year
- 1.4 million therms/year
- 77,247 metric tons CO₂e/year



Energy & Central Plant Retrofit



First Campus PV System (184 kW DC)



Boiler & Boiler Burner Replacement



Combined Heat & Power (CHP) Plant



Polytechnic Campus Central Plant



Energy Information System



North Loop Project/ Central Plant Interconnect



Solar PPA (17+ MWdc)

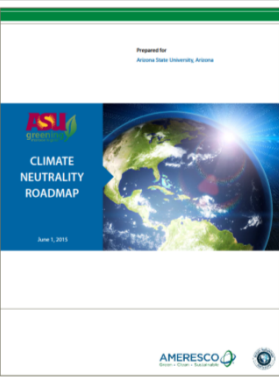


ASU CLIMATE NEUTRALITY ROADMAP



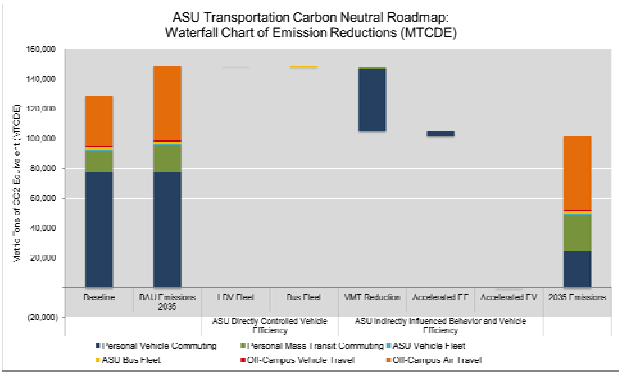
- Goals:
 - 2025: climate neutrality in buildings
 - 2035: climate neutrality including fleet, commuting, air travel
- Results:
 - Over 40 projects identified in first "living" Climate Neutrality Roadmap
 - Added \$169M investment over projected \$555 million energy spend by 2025 yields \$74M NPV (2049)
 - Cumulative GHG emissions reduction: 21 metric tons CO₂e

CALL TO ACTION SCENARIO TIMELINE (2025-2035) - METRIC TONS OF CARBON DIOXIDE EQUIVALENT (MTCO ₂ E) AVOIDED PER CALENDAR YEAR	2025	2032	2034	2035	2036	2037
NEW CONSTRUCTION	7,439	14,268	21,238	28,357	34,891	41,372
Energy Efficiency Improvements	1,000	2,000	3,000	4,000	5,000	6,000
DEEP ENERGY RETROFIT (DEER)	339	698	1,057	1,416	1,775	2,134
Implementation of deep energy retrofits at ASU facilities	339	698	1,057	1,416	1,775	2,134
DEEP OVER TIME (DOT)	31	290	540	790	1,040	1,290
Implementation of energy conservation and energy efficiency measures in occupied buildings	31	290	540	790	1,040	1,290
CROSS-CUTTING MEASURES (CCM)	10,212	14,476	17,648	20,720	23,792	26,864
Implementation of cross-cutting conservation measures in all buildings across all campuses	10,212	14,476	17,648	20,720	23,792	26,864
BEHAVIORAL PROGRAMS	3	12	21	30	39	48
Implementation of behavioral programs targeting students, staff, and faculty across all campuses	3	12	21	30	39	48
STREET	0	0	0	0	0	0
On-site solar	0	0	0	0	0	0
Off-site solar and wind	0	0	0	0	0	0
Biomass	0	0	0	0	0	0
Hydro	0	0	0	0	0	0
TRANSPORTATION	0	0	0	0	0	0
Air Travel	0	0	0	0	0	0
ASU Vehicle Fleet	0	0	0	0	0	0
Off-Campus Fleet	0	0	0	0	0	0
Commuting (via Bus, Shared, or Carpool Transit)	0	0	0	0	0	0
INFRASTRUCTURE IMPROVEMENTS	0	0	0	0	0	0
On-Site Power Generation Projects	0	0	0	0	0	0
On-Site Power Generation (Solar)	0	0	0	0	0	0
On-Site Power Generation (Wind)	0	0	0	0	0	0
On-Site Power Generation (Hydro)	0	0	0	0	0	0
On-Site Power Generation (Biomass)	0	0	0	0	0	0
On-Site Power Generation (Geothermal)	0	0	0	0	0	0
On-Site Power Generation (Other)	0	0	0	0	0	0
Off-Site Power Generation	0	0	0	0	0	0
Off-Site Power Generation (Solar)	0	0	0	0	0	0
Off-Site Power Generation (Wind)	0	0	0	0	0	0
Off-Site Power Generation (Hydro)	0	0	0	0	0	0
Off-Site Power Generation (Biomass)	0	0	0	0	0	0
Off-Site Power Generation (Geothermal)	0	0	0	0	0	0
Off-Site Power Generation (Other)	0	0	0	0	0	0
TOTALS	10,212	14,476	17,648	20,720	23,792	26,864
2025 Annual avoided GHG emissions (at year 2025) (MTCO ₂ e)	10,212	14,476	17,648	20,720	23,792	26,864
2035 Annual avoided GHG emissions (at year 2035) (MTCO ₂ e)	10,212	14,476	17,648	20,720	23,792	26,864
2025 Annual GHG emissions reduction (as percent of total GHG emissions)	10%	14%	17%	20%	23%	26%
2035 Annual GHG emissions reduction (as percent of total GHG emissions)	10%	14%	17%	20%	23%	26%
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ASU TRANSPORTATION-RELATED EMISSIONS AND MITIGATION STRATEGIES

- Transportation – 38% of total MTCDE emissions (FY12)
 - Fleet 0.3%
 - Employee commuting 6.5%
 - Student commuting 19.8%
 - Directly-financed air travel 7.6%
 - Study abroad air travel 3.4%
- BAU modeling shows 17% increase by 2035
- Getting to a zero footprint by 2035 is challenging!
- Reduce transportation emissions by 33% from BAU:
 - Reduce driving need, distance
 - Influence behavior and how cars are used
 - Use more efficient vehicles for remaining demand
 - Set carbon credit or renewable energy strategy for air travel and remaining transportation footprint



MAC CASE STUDY

- Minneapolis-St. Paul International Airport (MSP) governed by Metropolitan Airports Commission (MAC)
- Project details:
 - 3 MW PV on terminal 1 parking ramps
 - 8,705 PV panels and string-level inverters
 - 7,743 LED fixture conversions
 - 4 EV charging stations
 - 20 year guarantee with O&M services
 - 3-year PR/media sponsorship
- Financing:
 - 21 year muni lease financing with 0.75% net effective interest rate
 - 100% QECB funding with participation by 7 neighboring cities and counties
 - Grant from Xcel Energy
- Results:
 - 10 million kWh/year reduced energy requirements
 - 235 construction jobs
 - 6,813 metric tons CO₂e reduction per year



MASSACHUSETTS DOT CASE STUDY

Massachusetts powers solar systems

DOT plugs cost-saving panels along highways

Sunday, May 31, 2015

By: Marie Szaniszlo

Large swaths of green pasture along Massachusetts highways are being transformed into solar power fields that state transportation officials say could **save taxpayers \$15 million over the next 20 years.**

Ten sites ... along the Mass Pike have been selected for the first phase of the project. And the Department of Transportation is canvassing another three sites along state highways for the second phase, with the goal of producing at least **6 megawatts of solar power**, said Michael Verseckes, a DOT spokesman.

“MassDOT’s development of solar (energy) facilities within the state highway layout is driven by the desire to create energy savings by producing electricity locally and economically, optimize the use of underutilized state land and reduce greenhouse gas emissions via renewable power generation technologies,” Verseckes said.

After a lengthy procurement process, the DOT selected Ameresco Inc., a Framingham renewable-energy company, last June to design, finance, construct, operate and maintain the solar panels ...



PHOTO: John Wilcox
BRIGHT: Solar panel fields, such as one near the Mass Pike in Framingham, above, will help save on electricity costs.



Boston Herald, [“Massachusetts powers solar systems”](#), 5/31/2015.

GOVERNMENTAL ENTITIES HAVE MANY PRIORITIES TO ADDRESS AT ONCE

NEEDS

- Asset performance and management
- Reduced operating costs
- Reduced capital requirements
- Modernized facilities
- Environmental compliance
- Resiliency
- No technical or financial risk
- Meet mandates
- GHG emissions reductions from transportation



CHALLENGES

- Rising operating costs
- Aging infrastructure
- Lack of capital
- Revenue projects are decreasing
- Deferred maintenance
- Issues related to rising taxes, floating bonds
- Climate change mitigation will change transportation business models



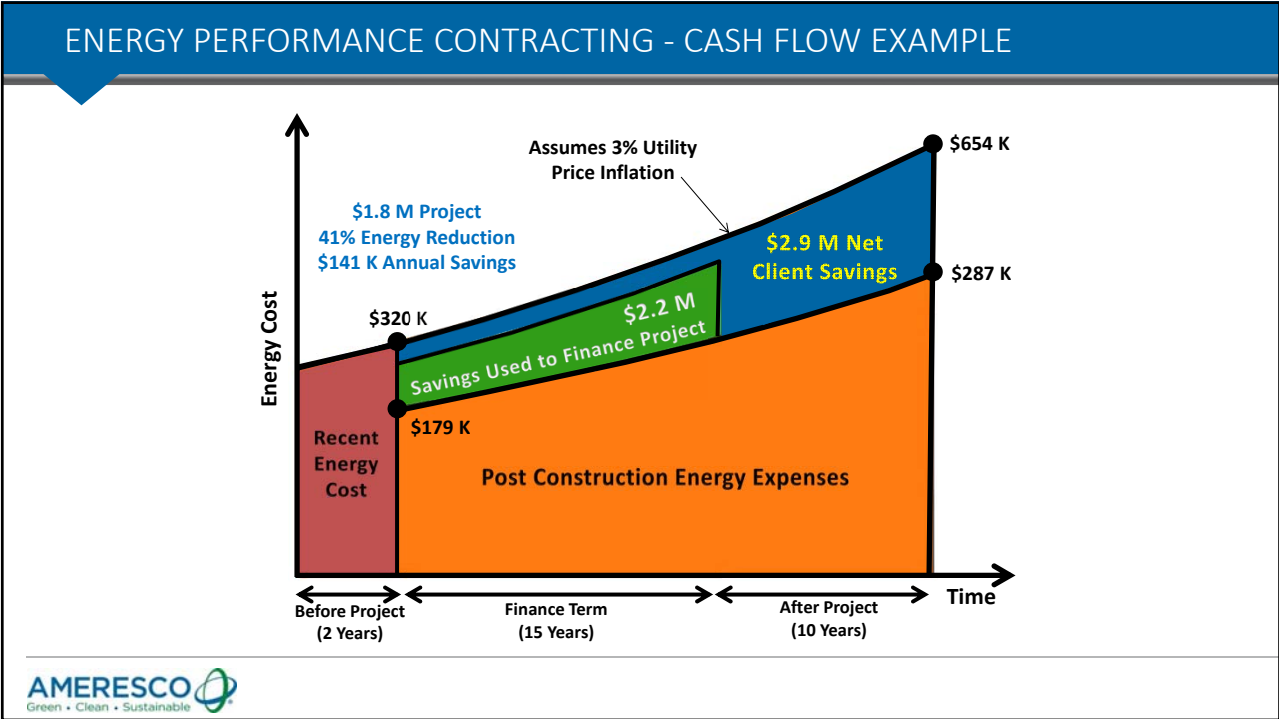
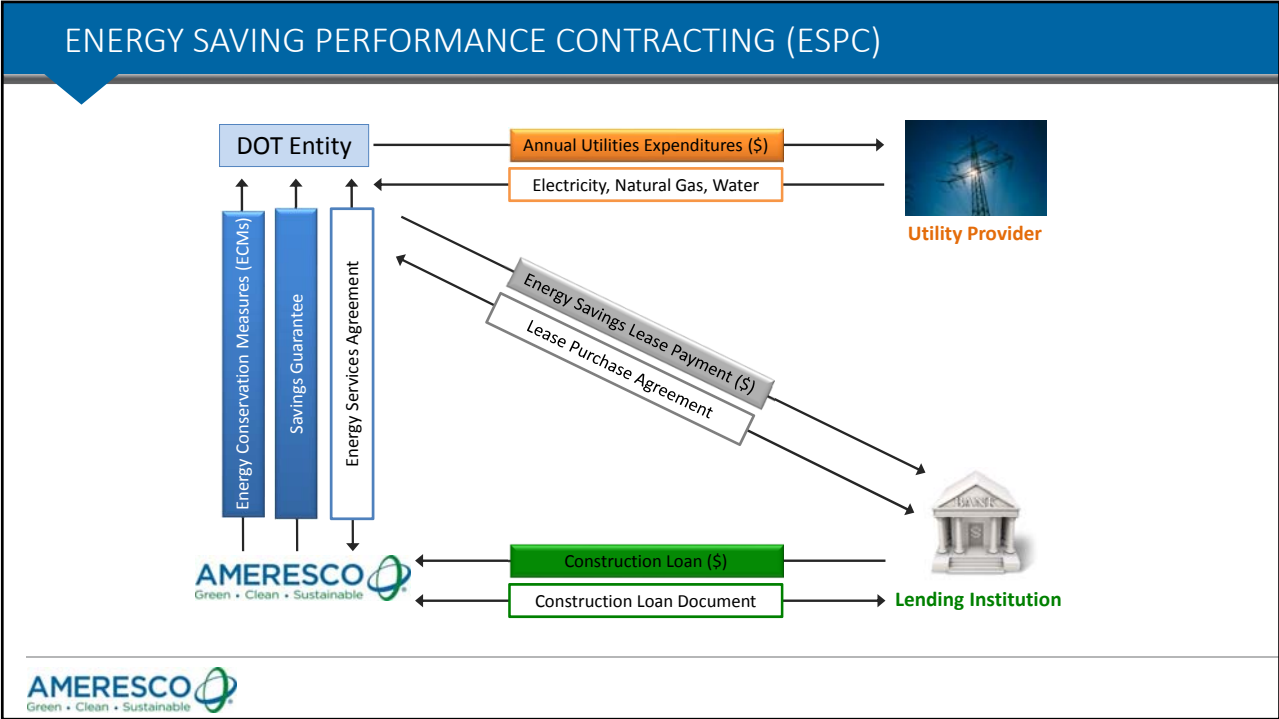
TAKE THE RIGHT STEPS IN THE RIGHT ORDER – AN INTEGRATED APPROACH

1. Define needs and set big fat audacious goals
2. Involve the entire community
3. Understand existing assets, BAU, future plans
4. Measure baselines and establish monitoring system
5. Reduce loads (energy, water, waste)
6. Select appropriate, efficient technologies
7. Seek synergies between systems and departments
8. Optimize controls and engage users
9. Integrate renewables
10. Develop and model options
11. Vet options with stakeholders
12. Identify critical enablers
13. Implement programs, enablers, and projects
14. Regularly assess progress and track results, including VBECS

CLIMATE NEUTRALITY

MAKING PROGRESS TOWARD CLIMATE NEUTRALITY

- The Climate Neutrality Continuum:
 - commitment → inventory → planning → goal-setting → resources → partnering → implementation → M&V → reporting → refine & improve
- Projects:
 - Demand-side: lights, buildings, vehicles
 - Infrastructure: utilities, networks, fleets, back-up power, materials
 - Supply-side: renewables, energy storage, smartgrid
 - Transportation: reduce VMT, behavioral programs, efficient vehicles, offsets
 - Critical enablers: policies, programs, organizational & institutional initiatives
- Partnering and best practices:
 - SSTI; structured financing; P3; performance contracting; power purchase agreements; best-of-class support



THE ECONOMICS OF SOLAR

- Implementation cost
 - Varies by application, scale
- Investment Tax Credits (30% of system cost)
 - Expiration December 31, 2016
- Utility Incentives – Different Every Market
- Avoided cost calculations and escalation rates
 - Time of Use
 - Solutions for \$0.06/kWh to \$0.12/kWh, depending on escalation, technology integration and etc
- Demand Savings
 - Battery / Controls Solutions
 - Shifting Rate Structures (Energy to Demand Shift)
 - 15 minute utility data reviews



FINANCIAL APPROACHES

- **Power Purchase Agreement (PPA)** – 15 to 25 year financing for solar only options in which there are no up-front costs and Customer pays for each kilowatt-hour generated by solar. The PPA rate and annual escalation may provide flexibility to achieve goals. Customer does not own solar generating assets. Customer may purchase solar assets at end of agreement for additional cost.
- **Lease Purchase (Lease)** – 10 to 25 year financing for all technology options included in the proposal in which lease payments are satisfied by energy savings. Customer pays low interest financing due to good credit. Additionally, Customer owns all equipment and solar generating assets. Low interest rates typically provide better return rates even without utilizing federal ITC.
- **Up Front Contribution** – No financing required as this utilizes available funds and/or future bond dollars to achieve highest return, own assets and potential to minimize operational dollars with capital dollars.



FINANCIAL APPROACHES

Finance Type	PPA	LEASE	Up Front Contribution
Contract Term	15-25 years	15-25 years	N/A
Term Ownership	3 rd Party/AMERESCO	Customer	Customer
Upside on over production	3 rd Party/AMERESCO	Customer	Customer
End of Term Ownership	Buyout option available	Customer	Customer
Up Front Capital Investment	Not Required	Not Required	Yes
QECB Participation	Not Available	Available	Available
Ability to Blend Technologies	No	Yes	Yes
Long Term Debt on Books	No	No	N/A
Interest Rate	Based on 3 rd Party/AMERESCO	Based on Customer Credit (Good)	N/A
ITC Monetized	Yes	No	No
O&M	3 rd Party/AMERESCO	Customer or AMERESCO	Customer or AMERESCO

