MassSolar

SolarIsWorking.org

The Truth About Solar Benefits For the Commonwealth

Solar Lobby Day
March 29, 2016

Who is MassSolar?

MassSolar is a non-profit organization representing Massachusetts solar businesses, solar owners, environmental advocates, community organizations and motivated citizens. We are dedicated to:

- Supporting the continued growth of the Massachusetts solar economy;
- Maximizing solar energy's potential as a solution to climate change;
- Modernizing the electricity grid; and
- Ensuring that everyone has fair and equitable access to affordable solar power.

Some of our affiliated organizations and companies:

RePower Partners

Boston Community Capital

Northeast Solar

GREENFIELD SOLAR STORE

solar design associates inc
harvard, ma 01451-0242 www.solardesign.com 978-456-6855

Solar is working for Massachusetts

Solar is delivering a wide range of economic, environmental and social benefits to Massachusetts communities and ratepayers

- **$1** invested in solar yields **$2.20 to $2.70** in benefits *(Source: Net Metering and Solar Task Force)*
- Solar supports almost **15,000 jobs**
- **36,000+** solar systems installed
- Solar provides long-term stable, predictable energy costs for Massachusetts businesses, protecting jobs

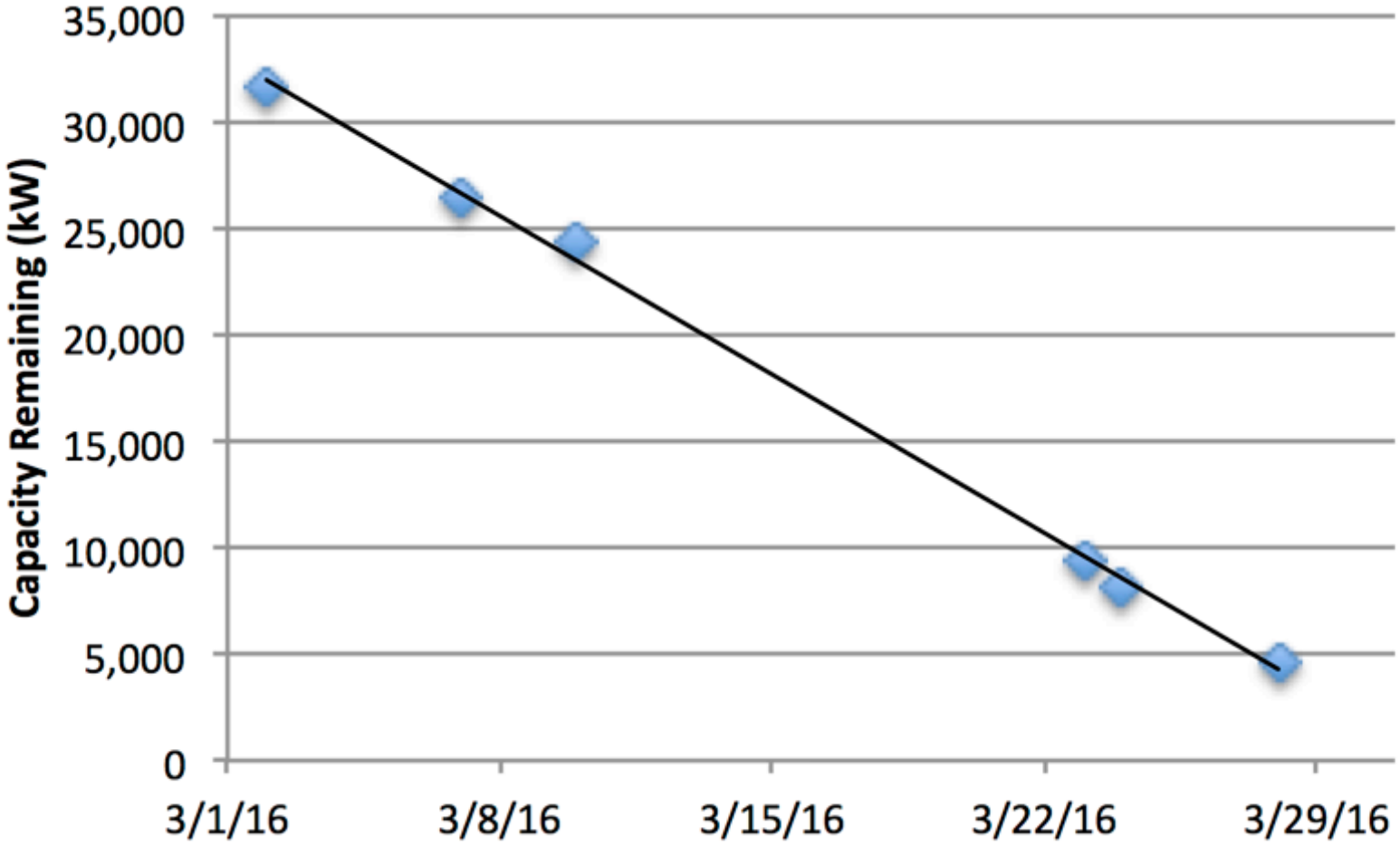
Solar Power in Massachusetts is Stalled

Why?

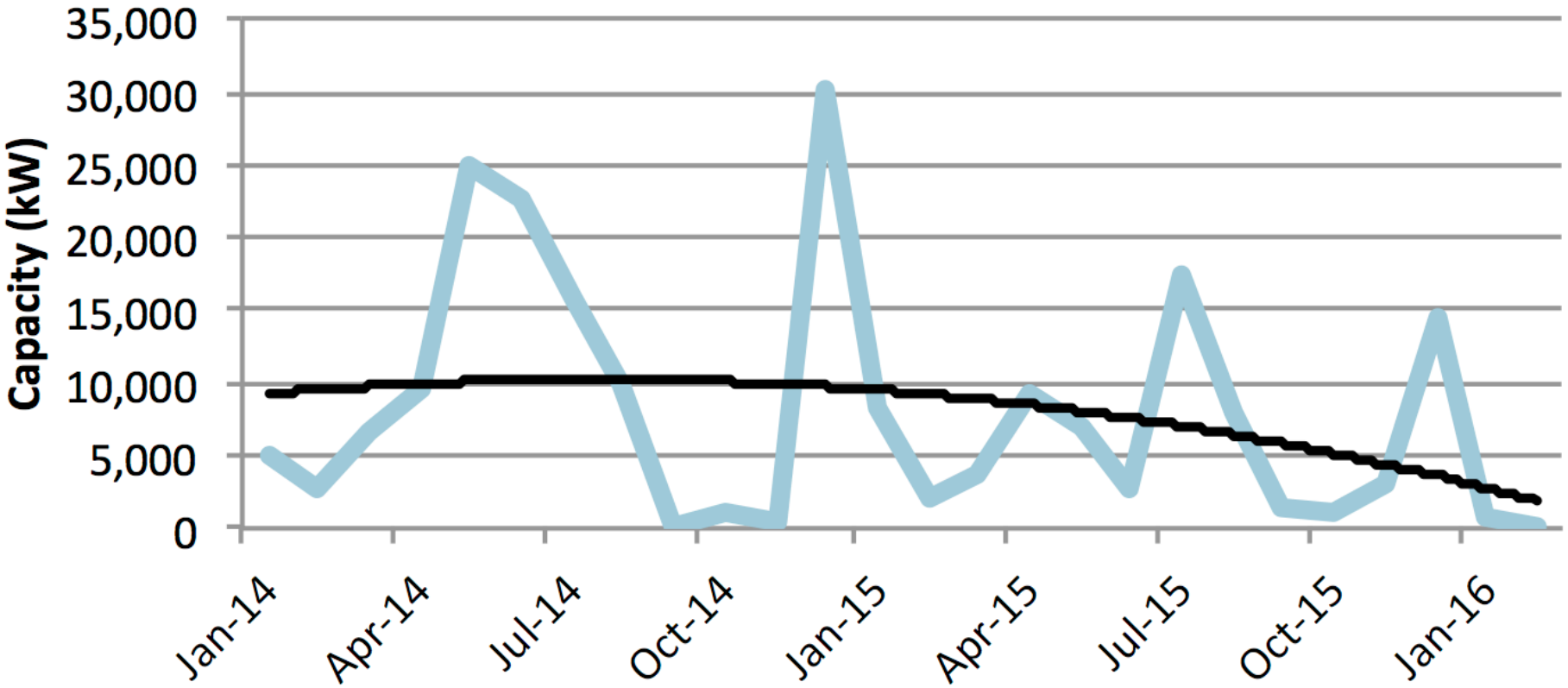
- Solar projects on hold for a year in 175 communities *(Note: small solar exempted)*
- Solar projects will be on hold in NSTAR territory this month – 250 communities!
- Solar owners incentive program closed since Feb 1st for all but smallest projects.
- Residential solar incentives will run out this month at current rate.
- Over $1 Billion worth of projects on hold

Caps hit in National Grid & Unitil territories
NSTAR is next

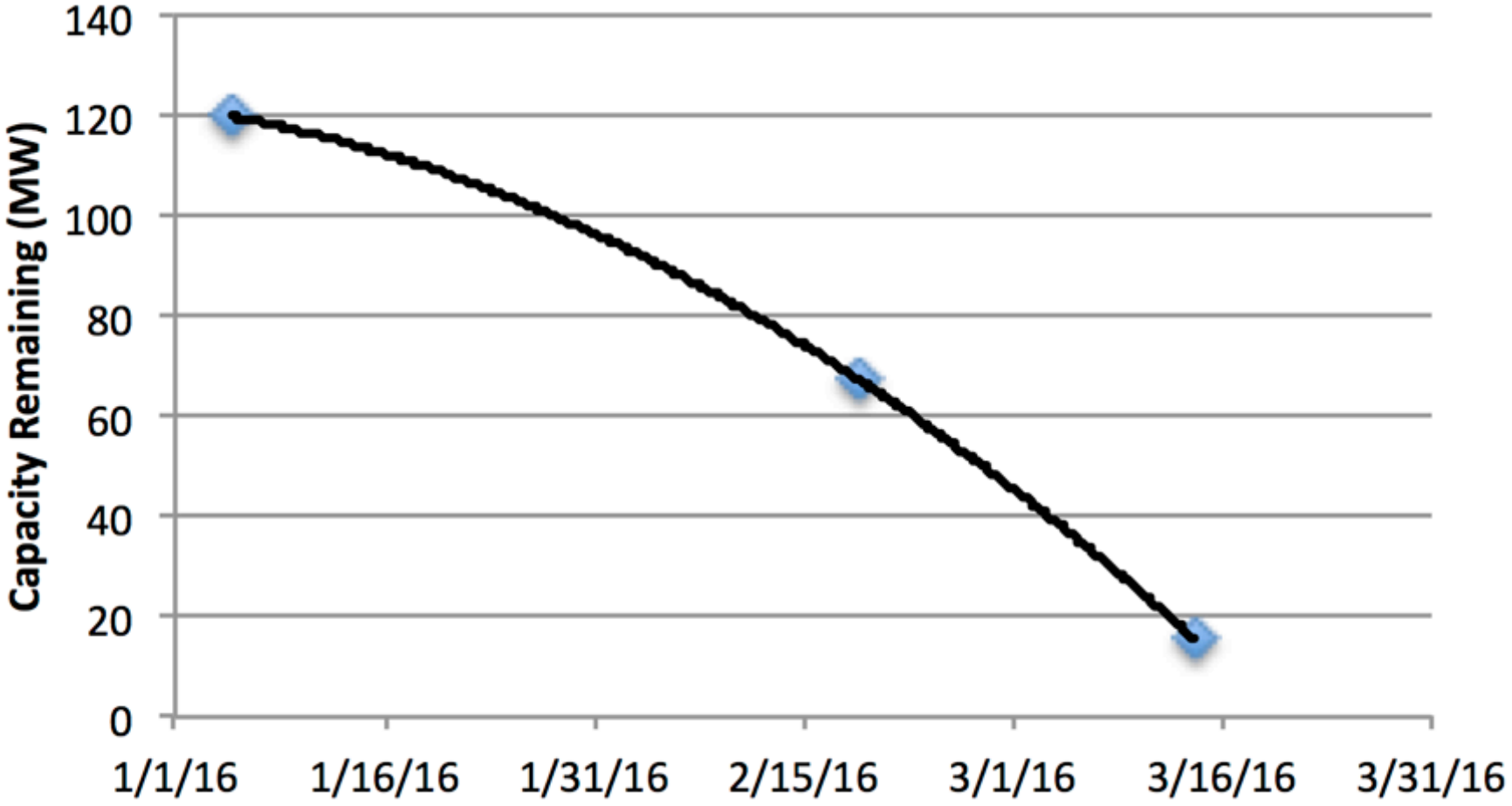
NSTAR Private Net Meter Eligibility
Capacity Remaining Under Cap



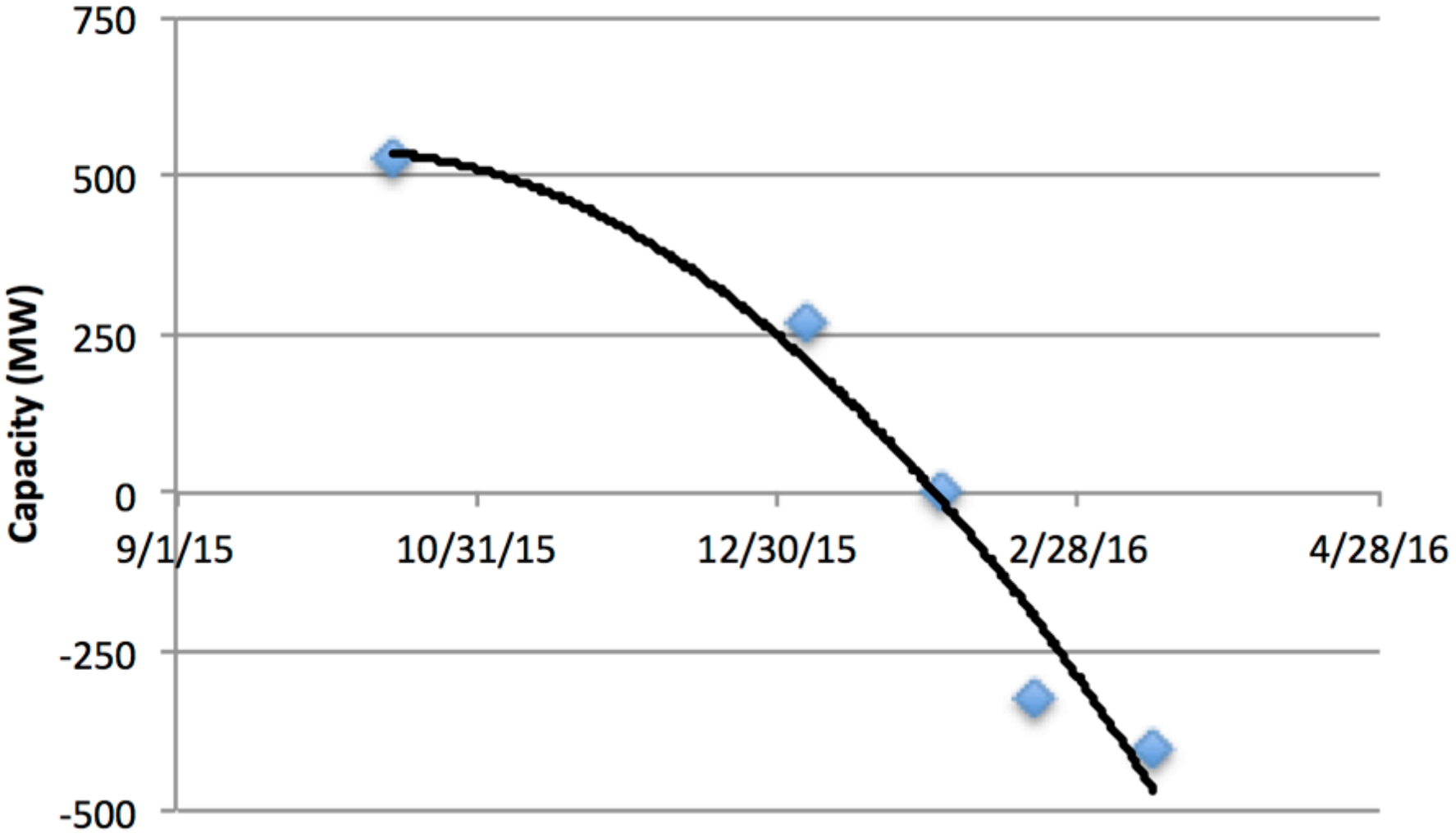
National Grid Solar Installations larger than 25 kW



SREC II Total Capacity Remaining
<=25 kW



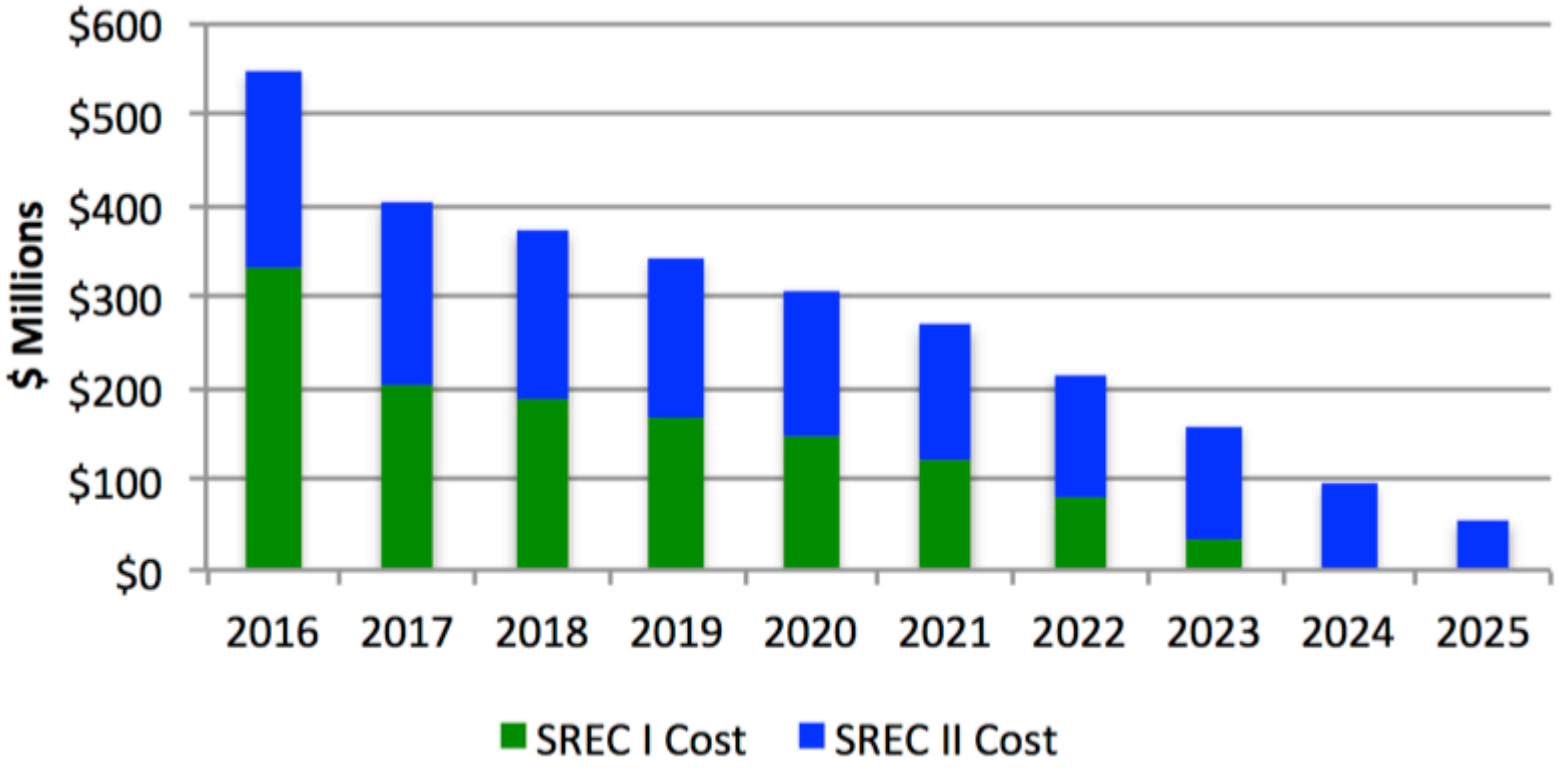
SREC II Capacity Remaining >25 kW



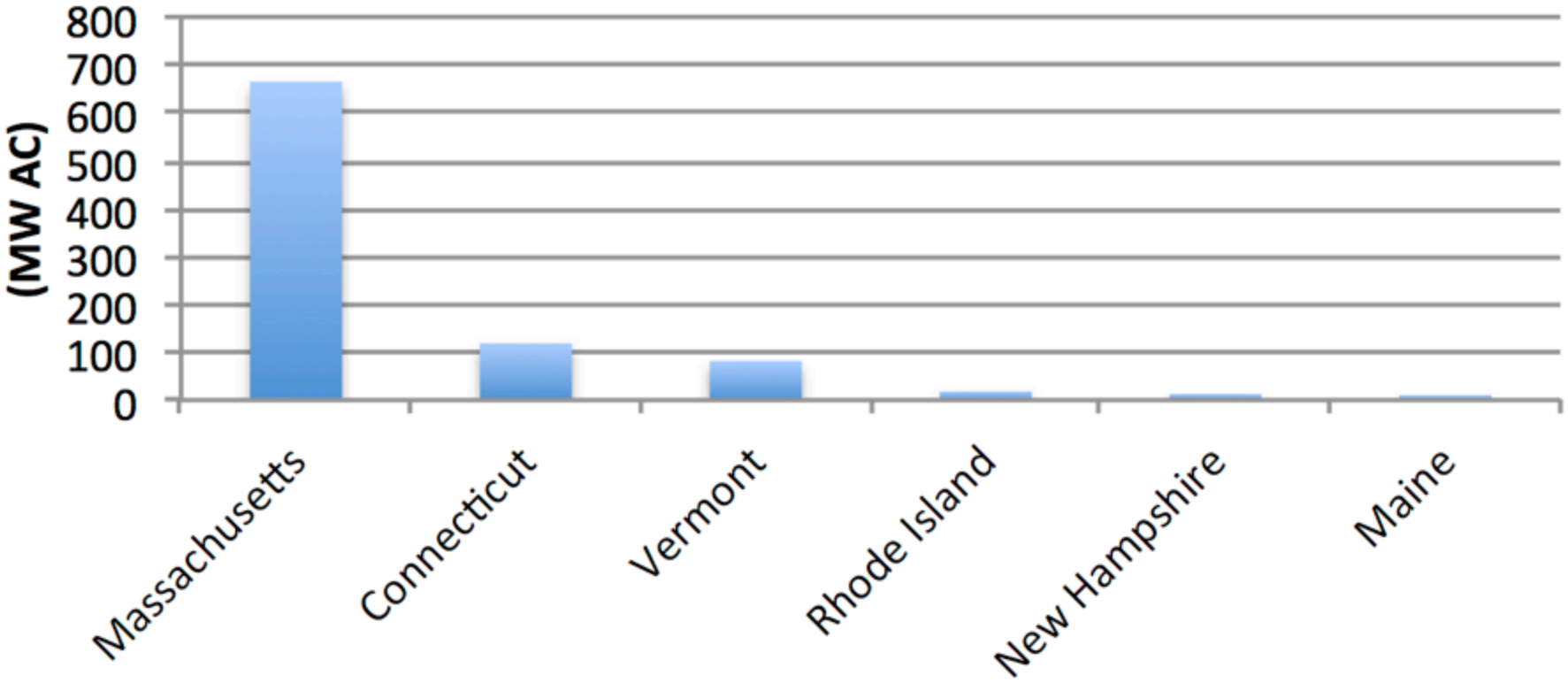
Massachusetts Projected SREC Costs

Massachusetts SREC program costs decline to zero over 10 years of production

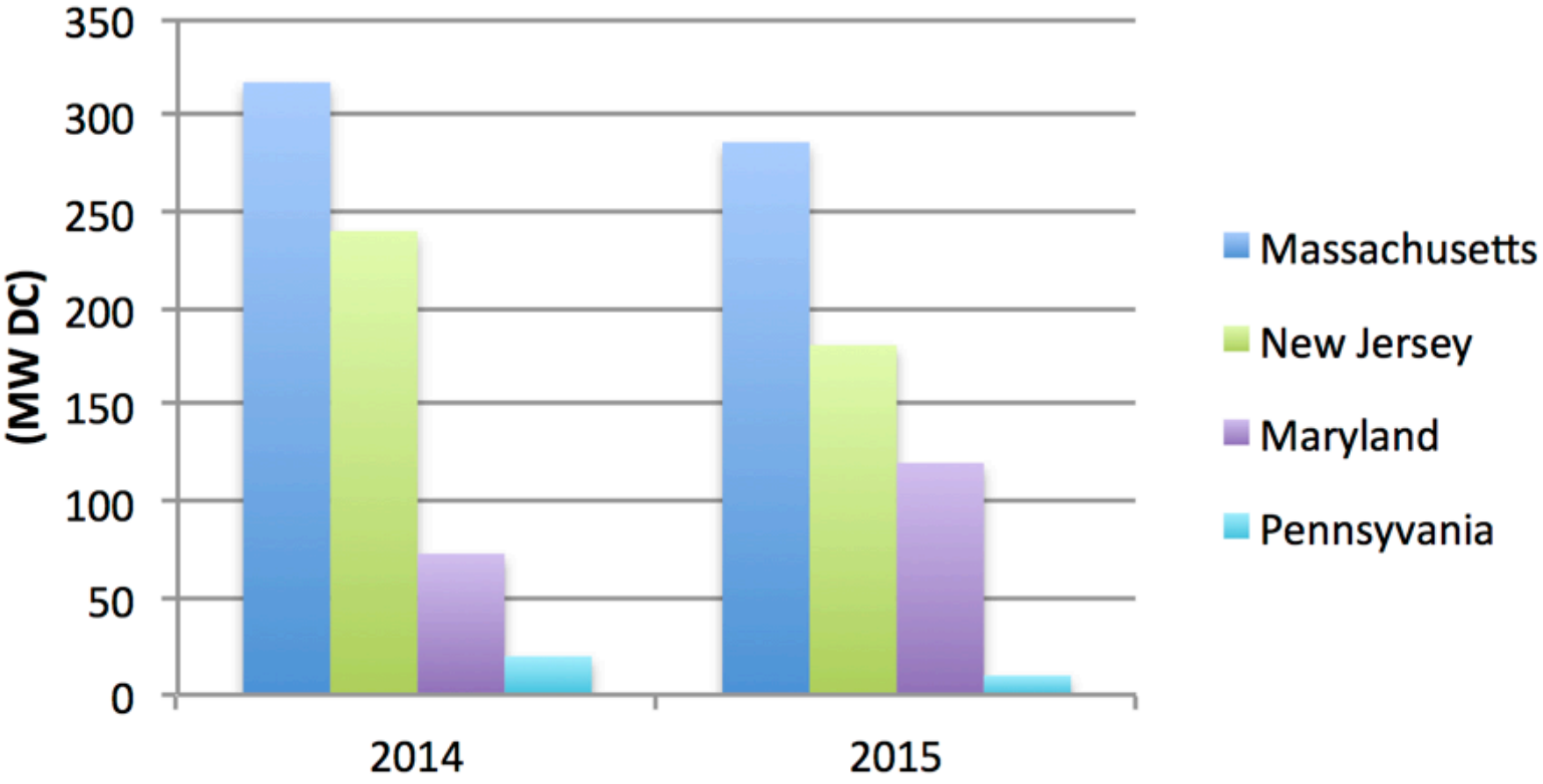
- Average SREC compensation is 6 cents / kWh over expected life of system
- Less than 6.7 cents / kWh in environmental benefits provided by solar
- SREC II prices 40% lower than SREC I prices



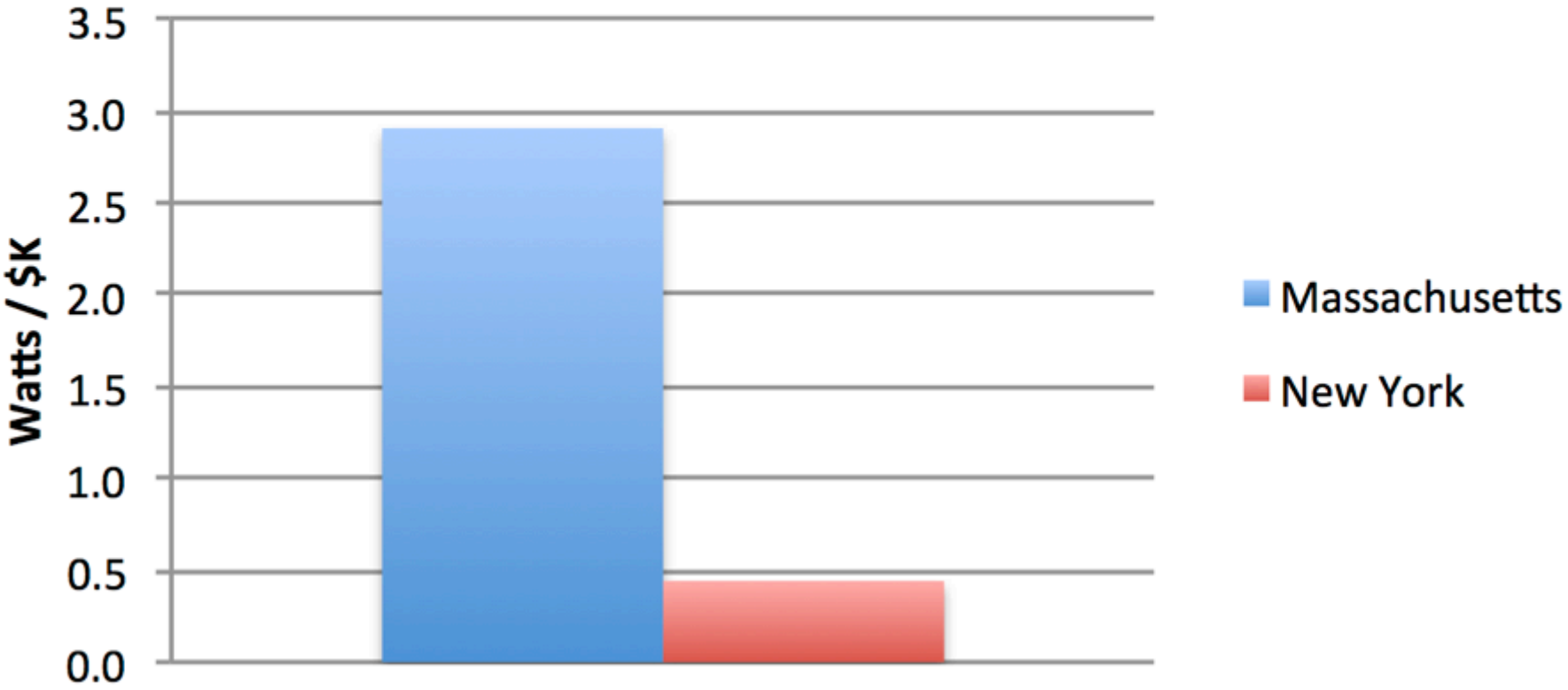
Cumulative PV Installations thru 2014



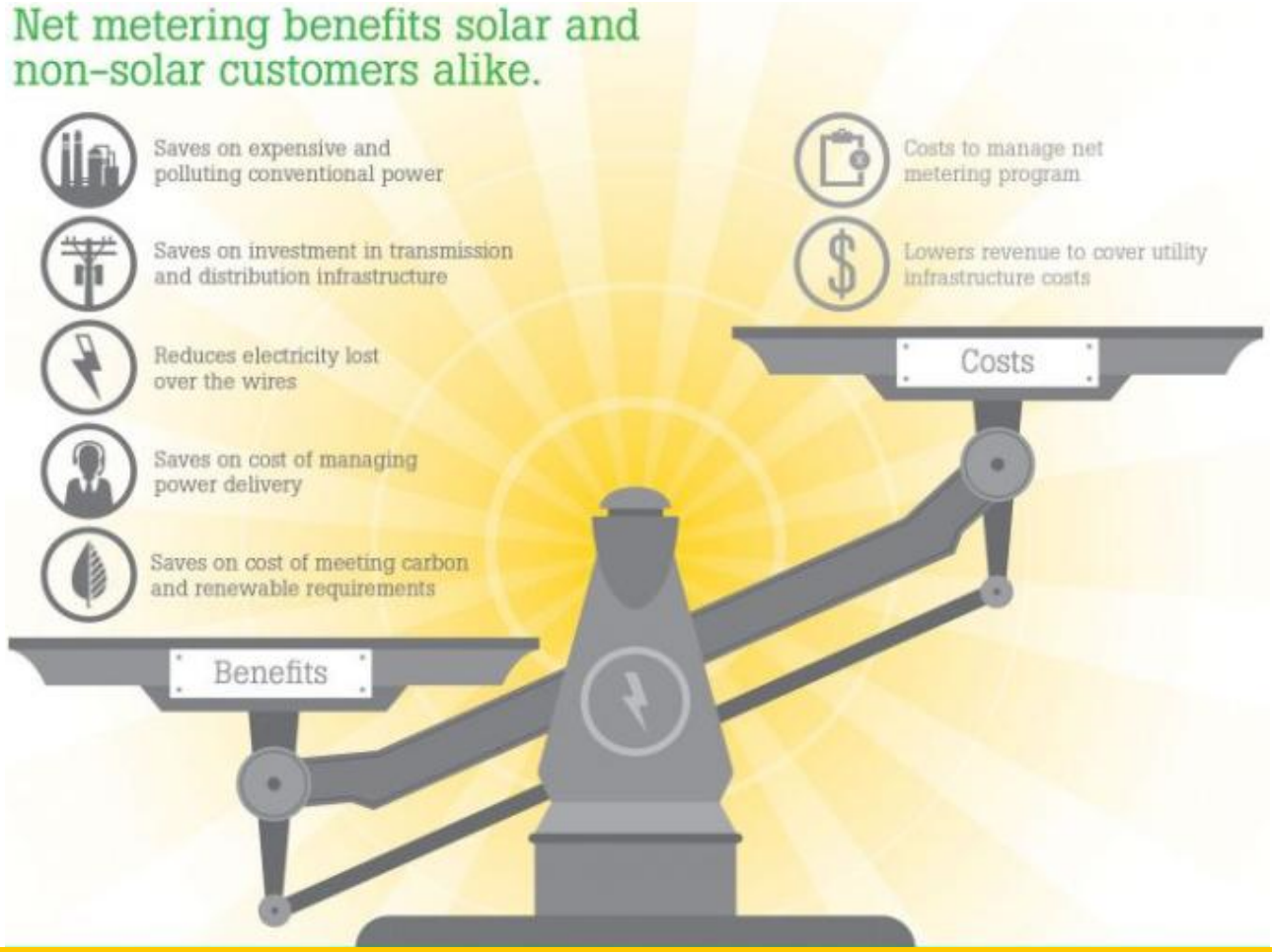
Annual PV Installations by State



Solar Installed per GDP (Watts / $K)



Solar benefits *all* ratepayers, not just those with solar



The Commonwealth at-large receives a total of $10.2 billion in net benefits from solar compared to net costs of $4.5 billion *(Source: NMSTF report, pg 195)*

Solar is working for low income communities

Oscar Romero House, New Bedford
12 units of affordable housing

- Community Action for Better Housing, pays electricity bills to keep costs affordable for low income tenants
- Annual electricity bill $5,500, jumped 28% last winter
- Rooftop not suitable for solar
- With off-site solar subscription, saving $1,200 a year, electricity costs now stable

Boston Community Capital

Solar is working for cities and towns

Lexington's 1.1 MW Solar Rooftop Project
5 Schools and Town Library

- **$5.6 million** savings over 25 years
- **$800,000** in health benefits
- **1.3 million kWh** insulated from winter energy price spikes
- Provides **15%** municipal electricity demand, enough to power 175 homes

Community shared solar allows everyone solar access

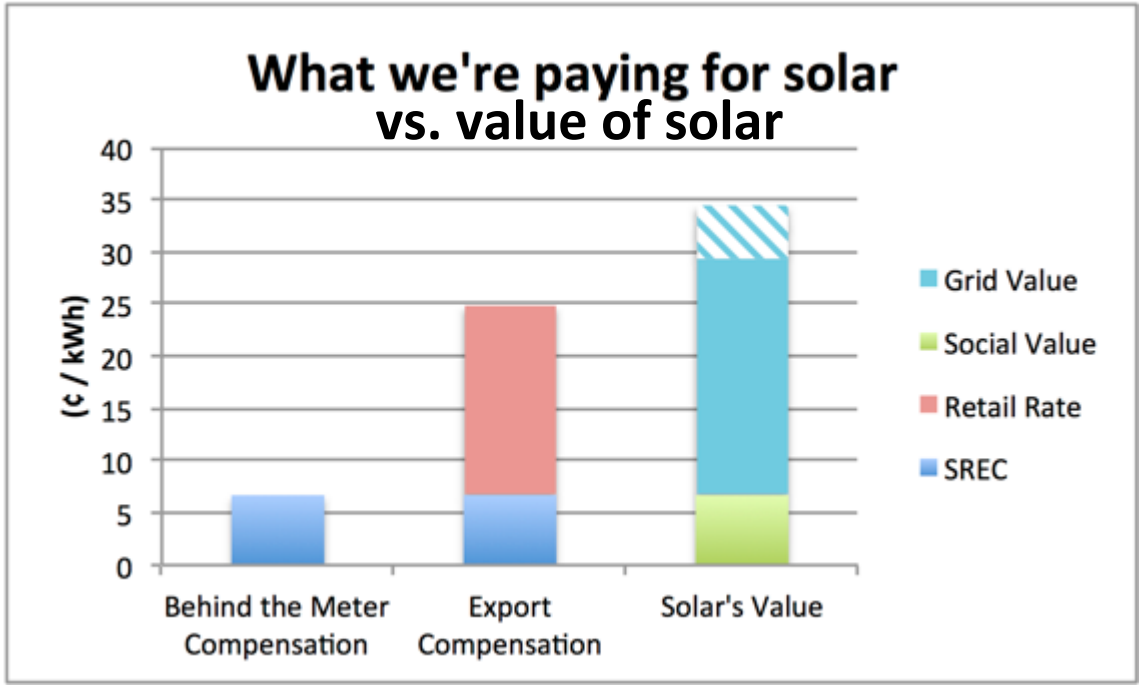
300 kW locally owned community solar in Pioneer Valley

- 8 in 10 residents in Massachusetts cannot put solar on their roof
- Local residents own a share of the system and receive ALL tax credit benefits
- Participants expected to save $600,000 on electricity bills over 20 years

Northeast Solar

What are we really paying for solar?

Solar owners receive between 6 - 24 ¢ / kWh, depending on system type and utility rate class



SREC II compensation is 6 ¢ / kWh averaged over expected life of system

Onsite consumption receives zero net metering credits

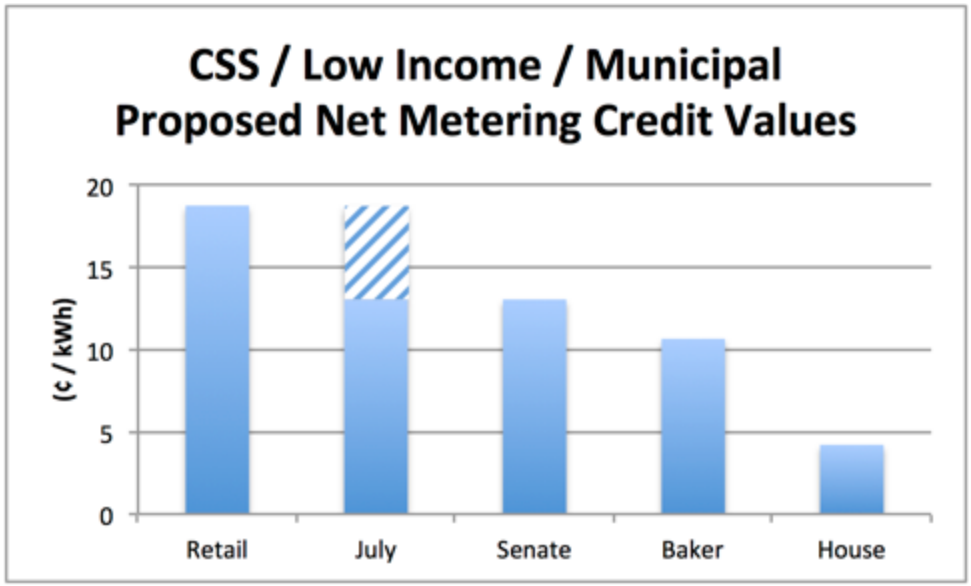
Exported power receives retail net meter credits ~18 ¢ / kWh

Value of solar is 29-34 ¢ / kWh including societal values of 6.7 ¢/kWh

Fair compensation for net metering is critical

Proposed legislation arbitrarily cuts net metering credit values 20%-75%

- NO consideration of solar's benefits
- NO consideration of project economic viability
- Proposals reduce solar access for low income, renters and those without sunny rooftops
- Rolls solar policy back to pre-2008, before Global Warming Solutions Act enacted



Net metering rate cuts kill projects

Low income

Oscar Romero House

Current savings: $1,200 / yr
Gov. bill savings: $ 500 / yr*
House bill savings: -$2,500 / yr

Municipal

Lexington

Current savings: $141,500 / yr
Gov. bill savings: -$ 31,000 / yr
House bill savings: -$ 96,000 / yr

Community shared

Pioneer Valley

Current savings: $30,000 / yr
Gov. bill savings: $ 5,900 / yr
House savings: -$25,680 / yr

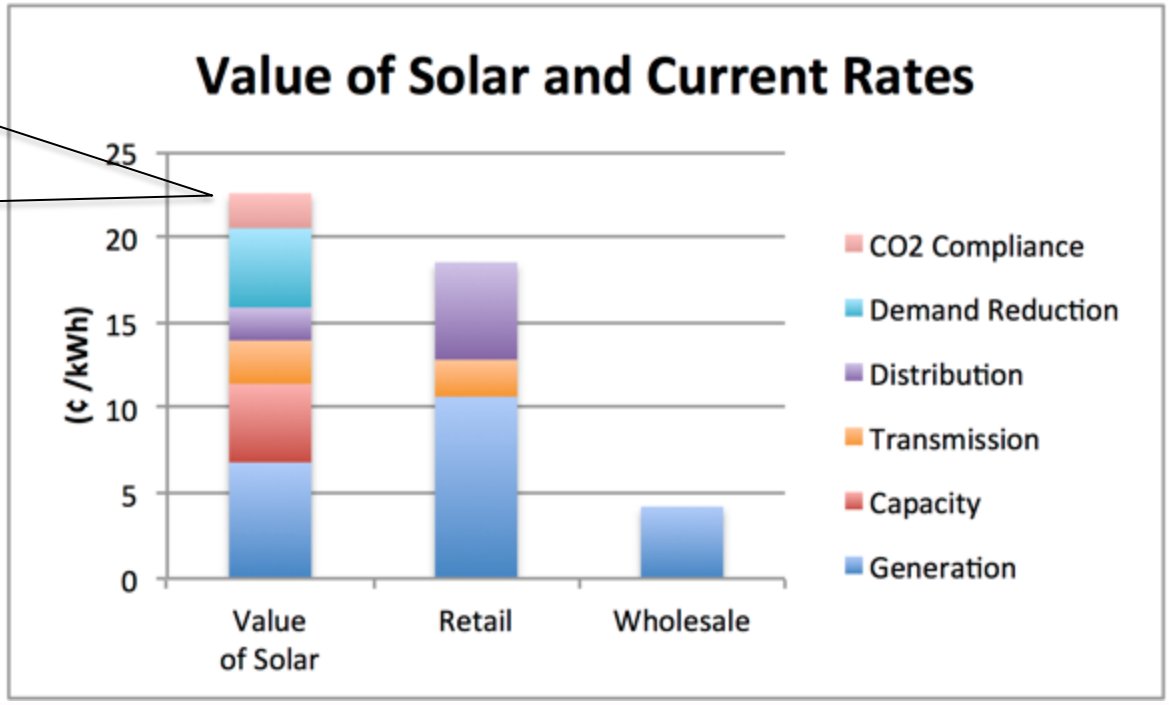
Note: Assumes SREC II incentives, which are no longer available

1 kWh Solar Energy is worth more than 1 kWh Fossil Fuel Energy

Studies show solar electricity is worth **MORE THAN** wholesale and retail rates

15,000 local jobs, cleaner air, cleaner water, lower health care costs
Reduces need for power plants, transmission lines and pipelines
Lowers energy price volatility and reduces greenhouse gas emissions

Acadia Center study shows the value of solar to the grid ranges from 22-28 cents/ kWh

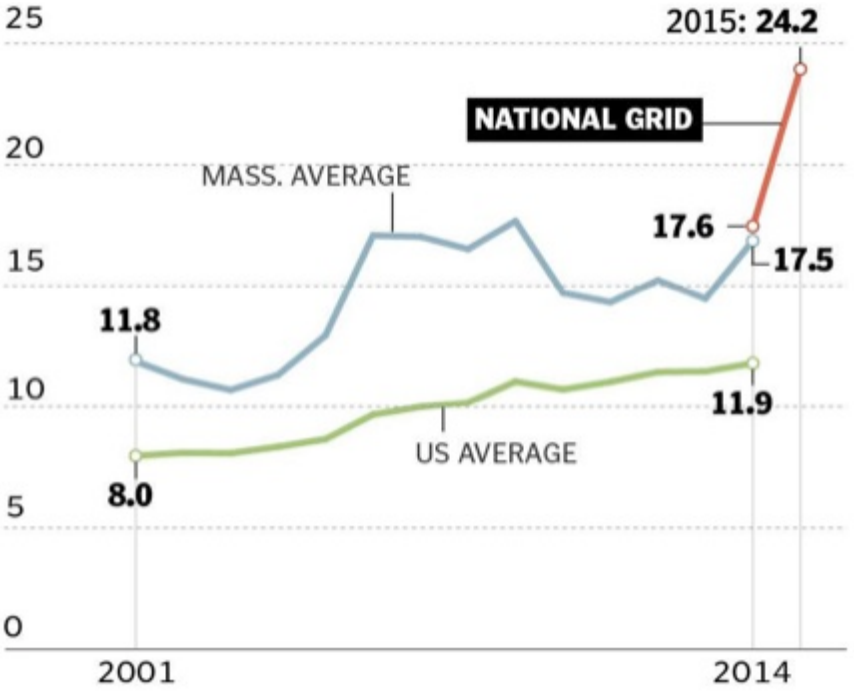


What are our costs if we stop investing in solar?

We could continue with the status quo

- Doubling down on natural gas
- Winter rates went from 17 cents / kWh to 24 cents / kWh
- Winter rate increase that cost ratepayers **$3.5 billion** a year for past two years

National Grid Electricity Costs ¢ / kWh



SOURCES: National Grid, US Energy Information Administration

LUKE KNOX/GLOBE STAFF

What will it cost if we stop investing in solar?

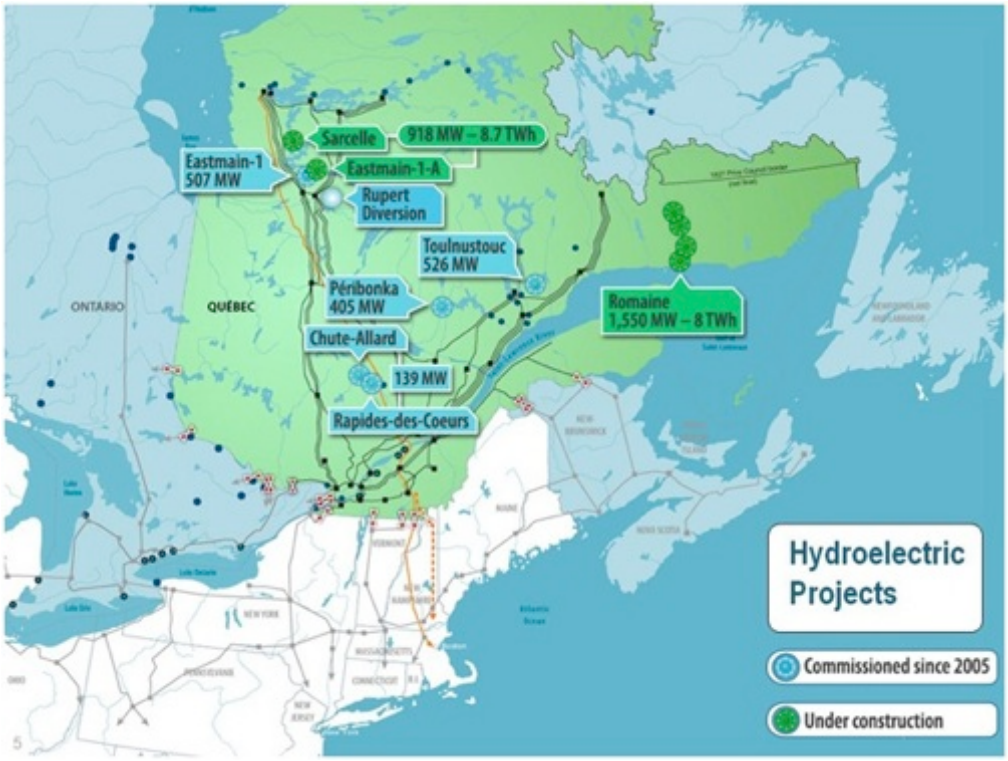
We could build pipelines

- National Grid has proposed $8 billion in new pipelines
- Eversource has proposed $3 billion in new pipelines
- Pipelines the Attorney General says we don't need
- Pipelines that will connect our natural gas to the world market
- Electricity rates will rise when natural gas prices rise to world market

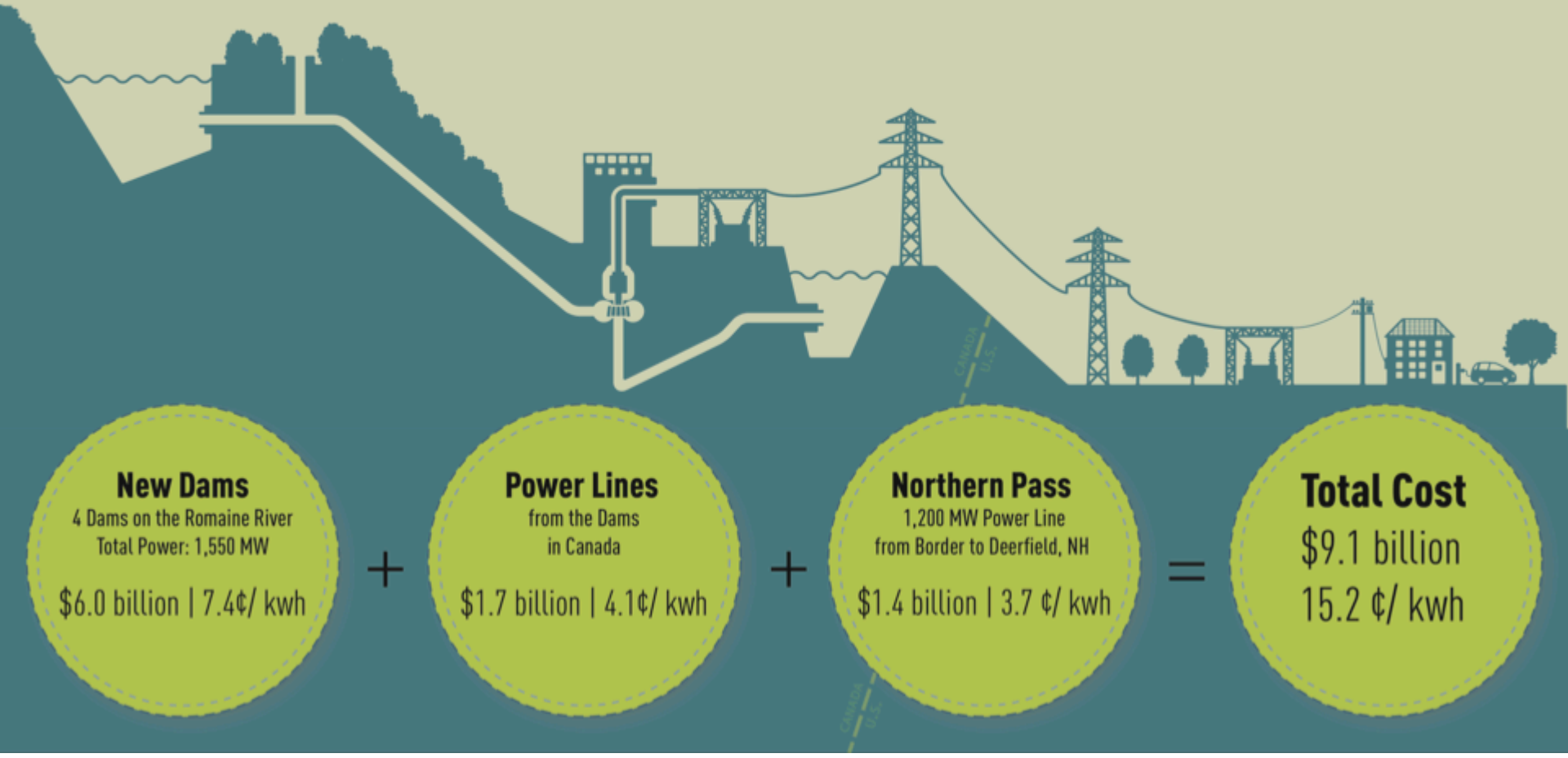
What happens if we stop investing in solar?

We could switch to Hydro Quebec

- Gov. Baker assumes buying hydro results in no greenhouse gas emissions
- But Hydro Quebec's own research contradicts this assumption
- Newly inundated reservoir has equivalent greenhouse gas emissions comparable to natural gas plant for 10 years after flooding
- 70% of natural gas power plant greenhouse gas emissions over 20 years



New England could pay more than $800 million above market prices every year for Hydro-Québec/Northern Pass hydropower.



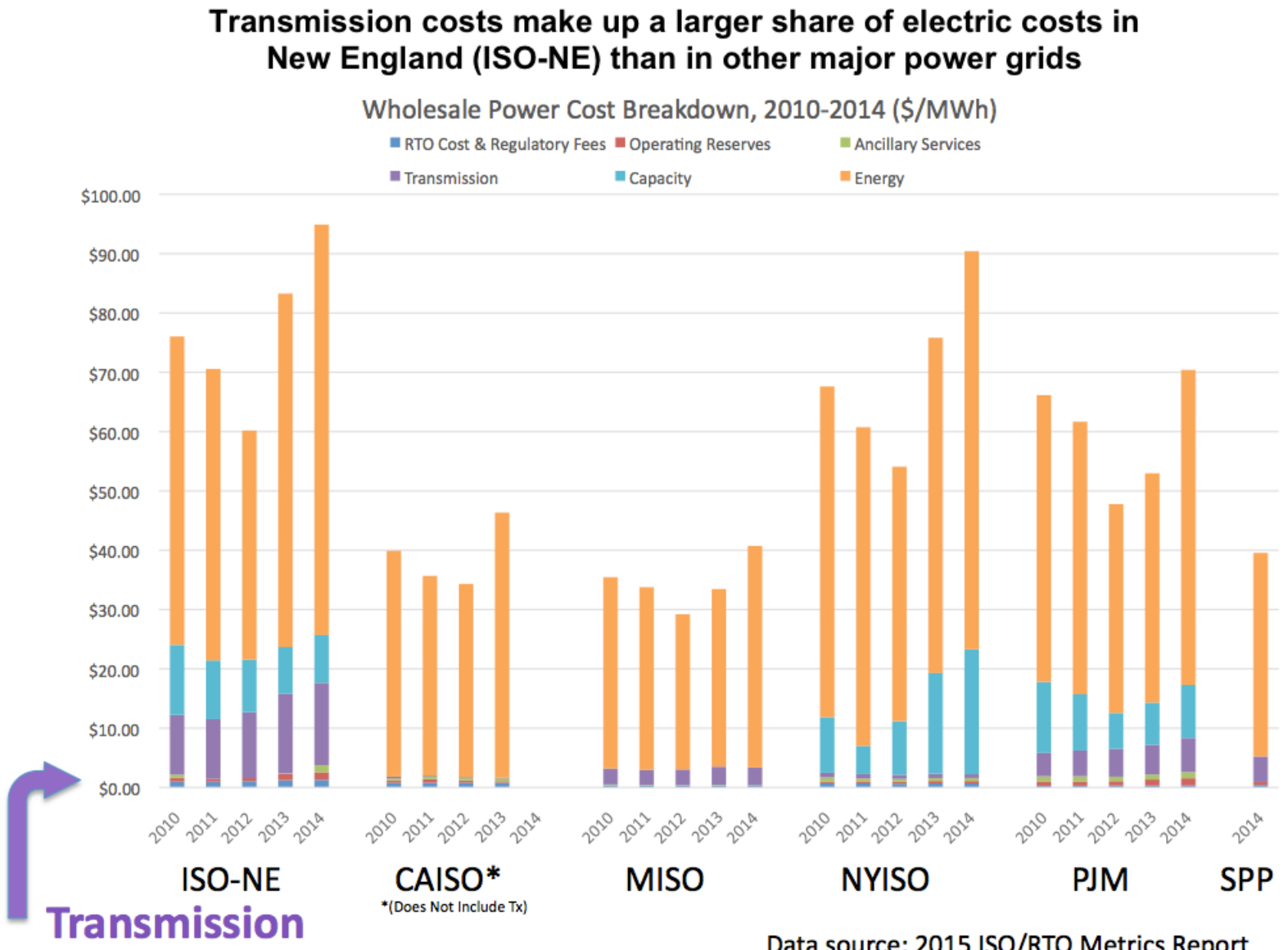
What will it cost us if we stop investing in solar

We could spend $7.6 billion on transmission lines

- $1.4 billion on Northern Pass
- $1.2 billion on NE Clean Power
- $2 billion on Champlain Hudson
- $1 billion on Maine Green Line
- $2 billion on Northeast Energy Link

- Last 11 Eversource and National Grid transmission line projects expected to cost $2.2 billion – final cost $3.9 billion

ISO-NE Transmission Costs Double 2nd highest region



FERC investigating ISO-NE Transmission Costs

FERC Order Instituting Section 206 Proceeding

- We find that:
- ISO-NE Transmission tariff and rates appear to be “unjust, unreasonable, unduly discriminatory or preferential, or otherwise unlawful.”

Talk to your Legislator about good solar policy

Consider benefits of solar as well as the costs

- Net Metering and Solar Task Force report shows every $1 invested in solar yields $2.20-$2.70 in benefits
- Solar benefits ALL ratepayers by lowering energy supply prices, diversifies our energy portfolio, avoiding need for investment in new infrastructure, generating power more efficiently, avoiding air pollution
- Solar creates jobs, builds healthier communities and expands tax bases
- Solar programs involve NO risk to ratepayers, i.e. solar only gets paid when it works, and encourages private capital to invest in new local generation, which is badly needed

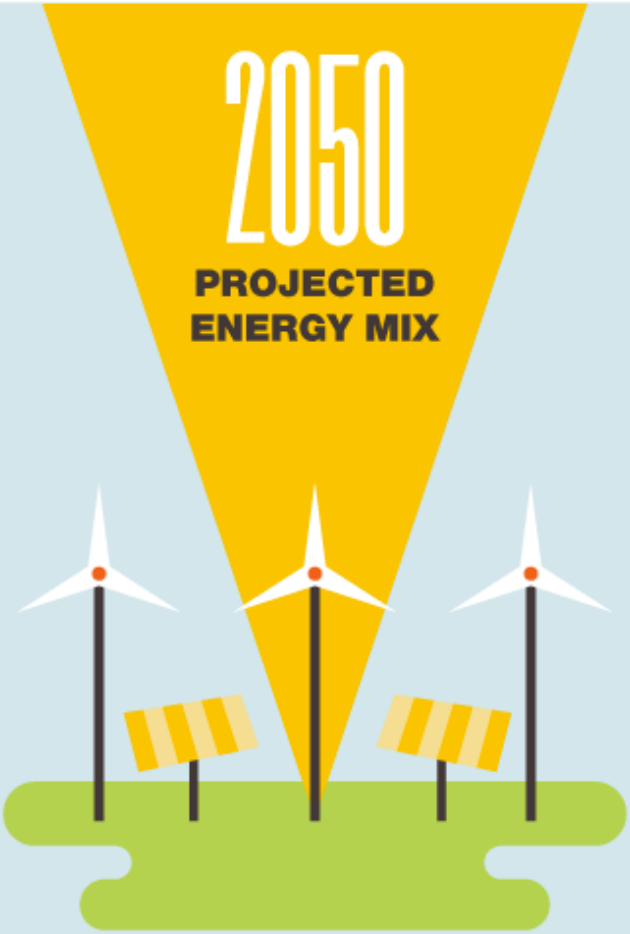
Good solar policy

Retain Retail Net Metering Rates
Implement SREC III program immediately
Grandfathering existing projects
No New Charges
Eliminate net metering caps

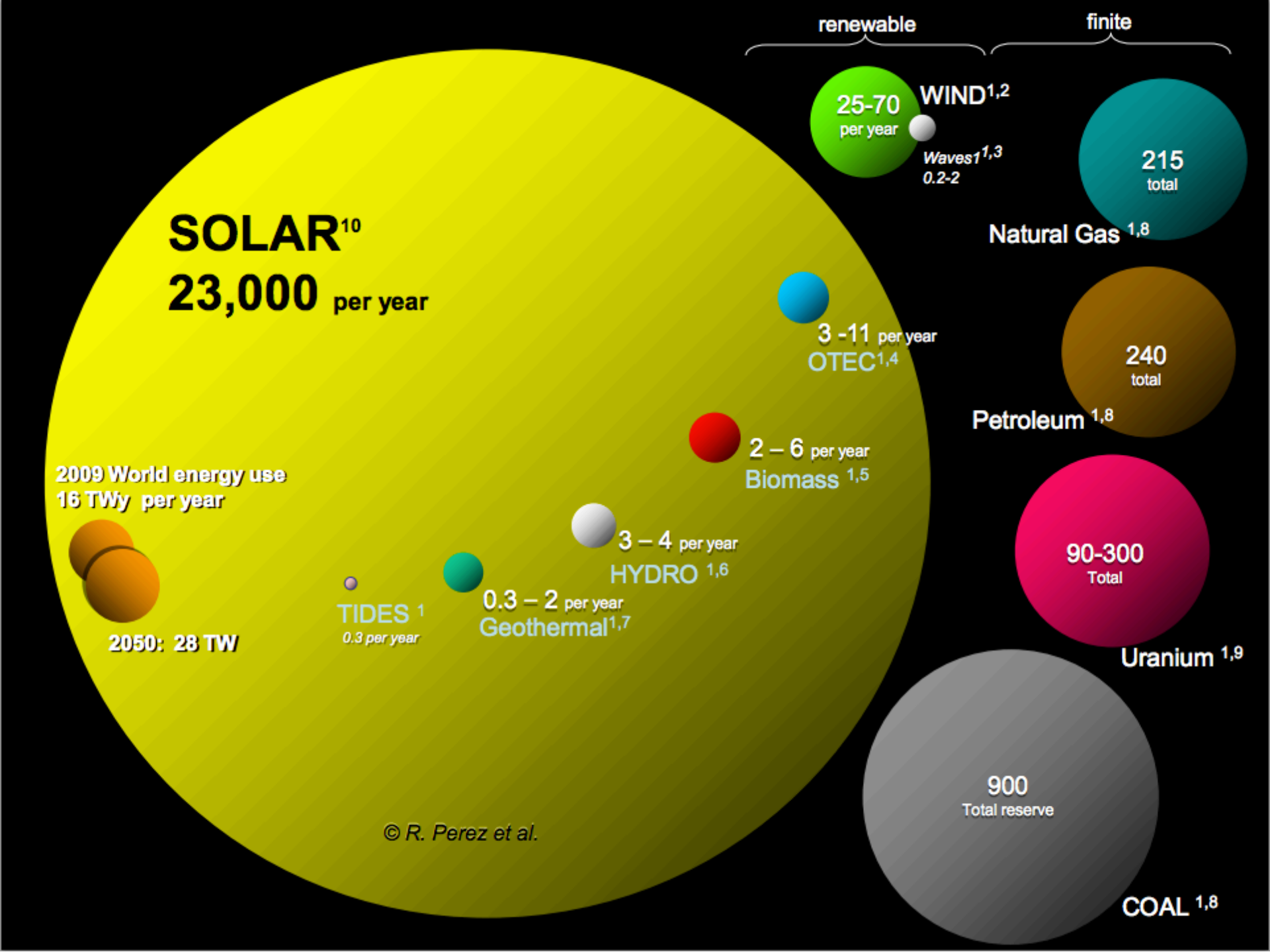
A sustainable, stable solar market cannot survive while caps constrain growth and unpredictable policies create a stop-and-start dynamic in the market

100% MASSACHUSETTS

Transition to 100% wind, water, and solar (WWS) for all purposes
(electricity, transportation, heating/cooling, industry)



- Residential rooftop PV **3.9%**
- Solar PV plants **22.3%**
- CSP plants **0%**
- Onshore wind **13%**
- Offshore wind **55%**
- Commercial/govt rooftop PV **3.3%**
- Wave devices **1%**
- Geothermal **0%**
- Hydroelectric **1.4%**
- Tidal turbines **0.1%**


renewable
finite
SOLAR[10]
23,000 per year
2009 World energy use
16 TWy per year
2050: 28 TW
25-70
per year
WIND[1,2]
Waves[1,3]
0.2-2
215
total
Natural Gas [1,8]
3 -11 per year
OTEC[1,4]
240
total
Petroleum [1,8]
2 – 6 per year
Biomass [1,5]
3 – 4 per year
HYDRO [1,6]
90-300
Total
Uranium [1,9]
TIDES [1]
0.3 per year
0.3 – 2 per year
Geothermal[1,7]
900
Total reserve
COAL [1,8]
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Questions?

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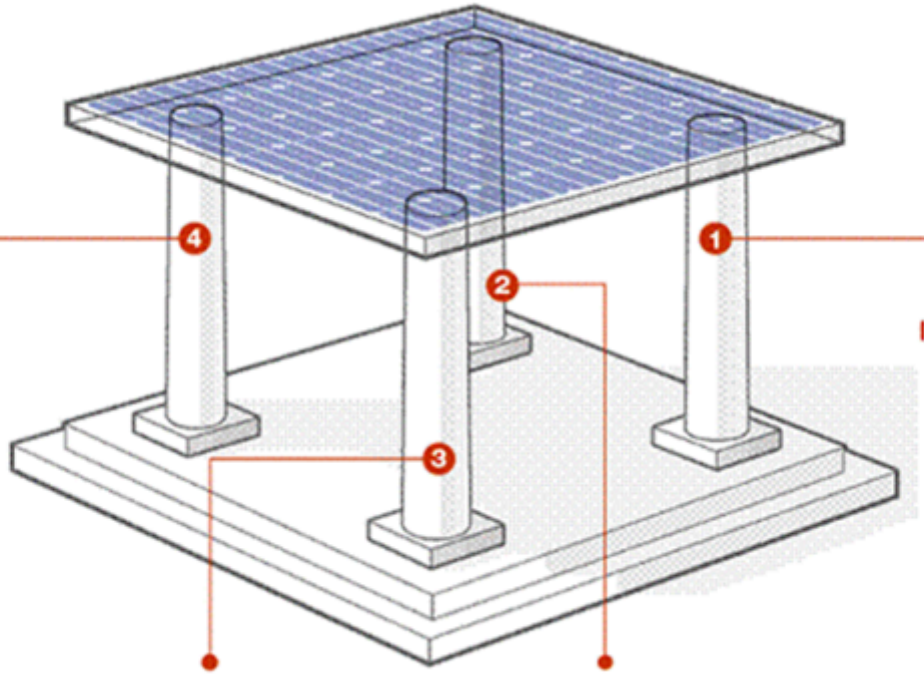
Four Pillars of Solar Policy



Utility Rates & Revenue Policies

- Create rate structure that aligns peak retail and wholesale costs
- Provide a range of rates that incentivize efficiency and peak reductions
- Remove standby charges and other solar-penalizing fees

Interconnection

- Keeps fees fair and proportional to project size
- Allow systems up to 2MW
- Make rules transparent, uniform, detailed, and public

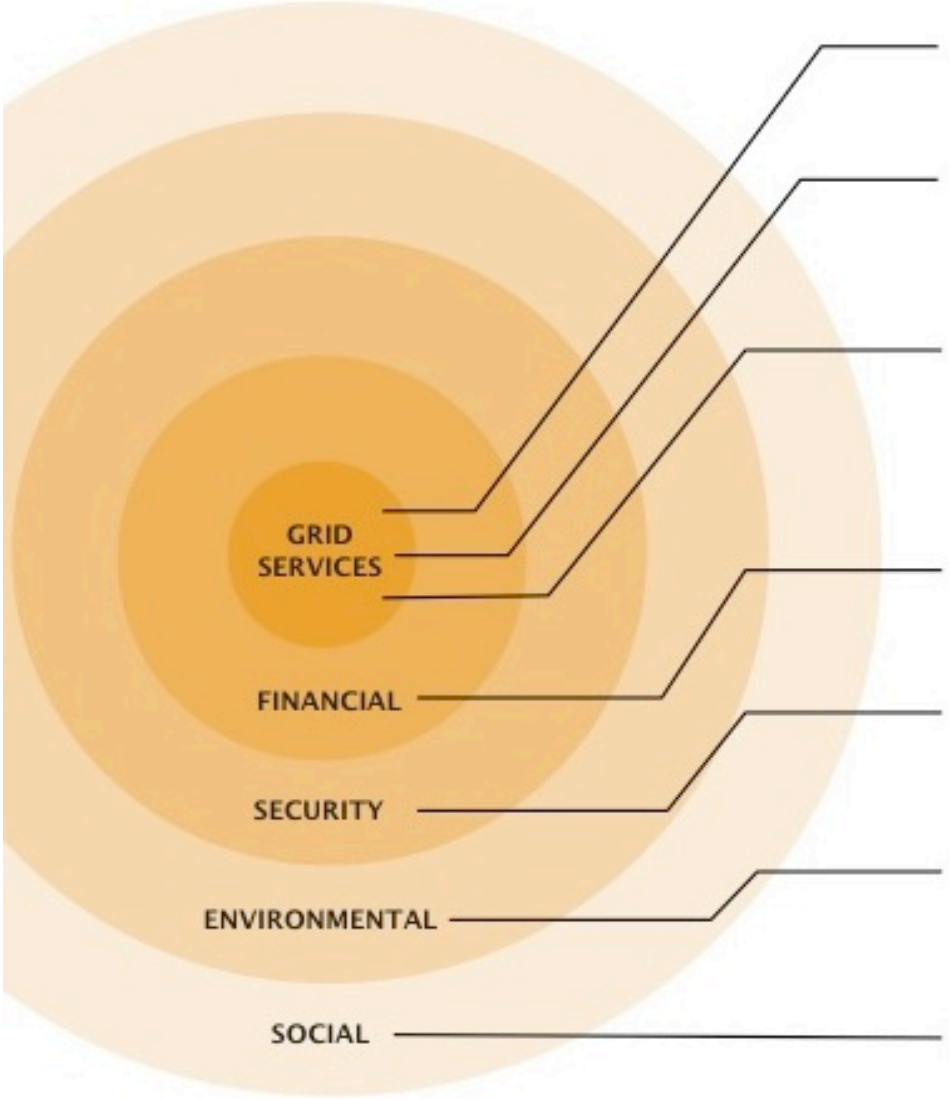
Net Metering

- Treat clean, on-site power the same as customer efficiency investments
- Allow net-metered systems up to 2MW
- Eliminate special fees

Incentives

- Tie incentives to system performance
- Support a broad range of system types and sizes
- Make incentive programs simple, transparent, and easy to administer
- Recognize the environmental attributes of solar production

Seven Circles of Solar Value



ENERGY
- energy
- energy losses

CAPACITY
- generation capacity
- transmission & distribution capacity
- DPV installed capacity

GRID SUPPORT SERVICES
- reactive supply & voltage control
- regulation & frequency response
- energy & generator imbalance
- synchronized & supplemental operating reserves
- scheduling, forecasting, and system control & dispatch

FINANCIAL RISK
- fuel price hedge
- market price response

SECURITY RISK
- reliability & resilience

ENVIRONMENTAL
- carbon emissions
- criteria air pollutants (SOx, NOx, PM10)
- water
- land

SOCIAL
- Economic development (jobs and tax revenues)

Vocabulary

1. **Net Metering**- Allows solar owners to receive compensation for solar generation. Key mechanism for encouraging development of solar.

2. **Net Metering Caps**- Statutory limit on the amount of net metering allowed in each utility territory, based on peak demand.

3. **Virtual Net Metering (VNM)-** Allows solar owners to share net metering credits with more than one utility account. Enables equal access to solar for everyone.

4. **Community Shared Solar (CSS)**- Makes solar available to those that don't own a sunny rooftop. A local solar project that shares net metering credits with members.

5. **SREC** – Solar Renewable Energy Certificate. Incentive for producing 1 MWh of solar electricity.

Solar mini-primer

Net metering

- Compensation for every kWh of electricity delivered to grid; **NOT** a subsidy
- Payment in the form of a credit on a utility electricity account
- Net metering "capped" by legislature for projects over a certain size
- *Accounting mechanism administered by the Department of Public Utilities*

Solar Incentive – Solar Renewable Energy Certificates (SRECs)

- Incentive for delivering environmental and societal benefits
- Designed to support goal of 1600 MW; almost no capacity remaining
- 1 MWh of solar electricity equals 1 SREC. Value of SREC depends on SREC factor.
- Taxable income, if the SREC is sold to another party
- *SREC II administered by the Department of Energy Resources*

Low income, municipal and community solar stalled

2% cap increase solves nothing. National Grid caps will still be in effect **after being raised**.

- 1% cap increase equals 51 MW in National Grid territory.
  - 69 MW: Public project net metering waiting list
  - 124 MW: Private project net metering waiting list

Old Colony affordable housing solar project in Boston