

Energy Efficiency Potential Studies: Why, How and So What?

Energy Efficiency as a Resource
ACEEE Fourth National Conference
Berkeley, CA

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October 1, 2007

Overview

▶ Why?

- What are the purposes of potential studies?
- How does the purpose influence the methods, data and level of analysis?
- What can studies do and not do to support different purposes?

▶ How?

- What are the different types of EE potential?
- What are the basic methods to estimate potential and different levels of effort?
- When do you need a full-scale study with primary data collection?

▶ So What?

- How are potential studies used at the policy level?
 - NY and New England Case Studies
- How are potential studies used at the program level?

Why?

Figure out why you need a study before planning or doing one:

- ▶ Do you really need one?
- ▶ If so, what for?
- ▶ How detailed does it need to be?
- ▶ Who are the stakeholders?
- ▶ How will stakeholders use it?

Why?

Some Common Reasons to do Potential Studies:

- ▶ Making the case for efficiency
- ▶ Establishing energy efficiency portfolio funding levels and goals
- ▶ Allocating resources to different policy or program areas (*e.g.*, codes, standards, DSM, DR, CHP, etc.)
- ▶ Assessing reliability alternatives to traditional supply-side resources
- ▶ Program design support and analysis

How?

Purpose should drive methods

- ▶ Making the case for efficiency — Focus on overall opportunities and economics, don't sweat the details?
- ▶ Funding levels and goals — Will they realistically push the envelope of maximum achievable potential?
- ▶ Alternatives to supply — Need for greater detail, disaggregation and precision if driving time-critical resource planning decisions.
- ▶ Supporting program design or policy allocations — Need detail, but only focus on those markets that matter, don't worry about theoretical opportunities you won't consider.

How?

- ▶ Are different territories that different?
 - Yes, but...
 - Do you have data to support the differences?
 - Baseline studies
 - Industrial sector, building type and end-use breakdowns
 - End use Load shapes
 - Do you need the level of precision that requires a great deal or primary data or can you draw off of other regional efforts?
 - NEEP New England Study
 - Western Governors' Study
- ▶ Avoid false precision.

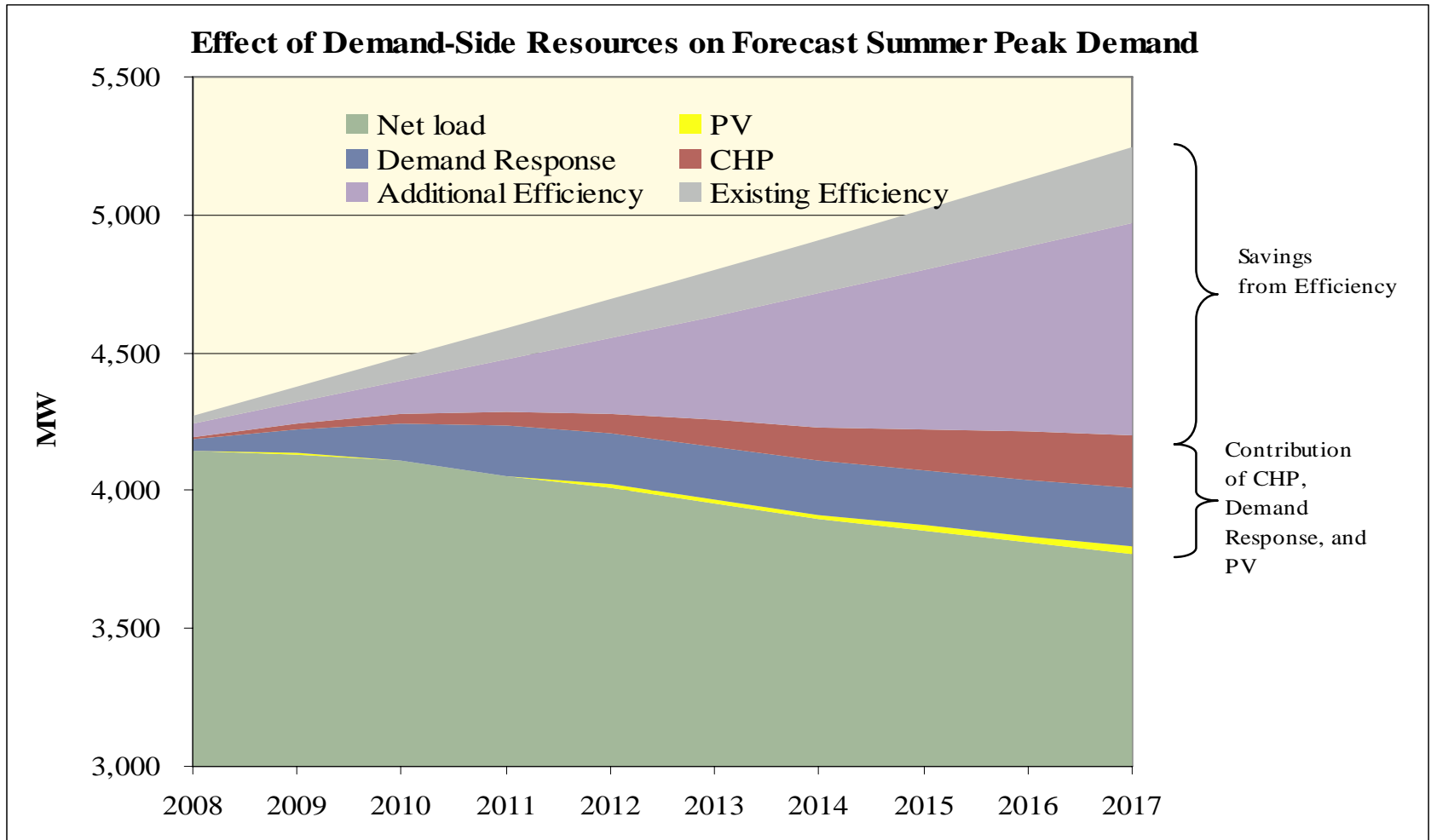
So What?

- ▶ What will influence decision outcomes? — Purpose and stakeholders drive results and their presentation
 - GWh
 - Peak MW
 - % of forecast
 - Hourly reliability effects
 - Funding needs
 - Societal economics
 - Carbon reductions
 - Jobs

Case Study: New England — Getting to Zero

- ▶ **Why:** First cut look at whether DSM resources can meet all new load growth over planning horizon.
 - Large New England Utility
 - To support strategic planning decisions at the policy level
 - Inform stakeholder legislative and regulatory processes
 - Not intended to set funding needs or DSM plans
- ▶ **How:** High level Study — fast and cheap
 - Review of existing data and studies for area and nearby regions
 - Segmented loads by sector, building type, end use
 - Applied results from existing information by segment, developed ramp up and penetration rates, considered economic and environmental impacts
- ▶ **So What:** Supporting high level strategic thinking, input to future more detailed study.

Case Study: New England — Getting to Zero



Case Study: New York — Electric and Gas Potential — Why?

- ▶ Estimate Technical and Economic Potential to support a wide range of purposes
 - Understand overall size of opportunities and economics and environmental impacts associated with them
 - Support policy and resource allocation decisions, including potential Gas SBC
 - Support future program development and planning
- ▶ Stakeholder process
- ▶ Did not estimate Maximum achievable potential
 - Electric Gas Greenhouse Gas Scenario
 - Gas Program Scenario

Case Study: New York — Electric and Gas Potential — **How?**

▶ Detailed analysis

- Bottom-up analysis by measures, markets and segments
- Highly segmented, over 2,000 measure permutations

▶ Results:

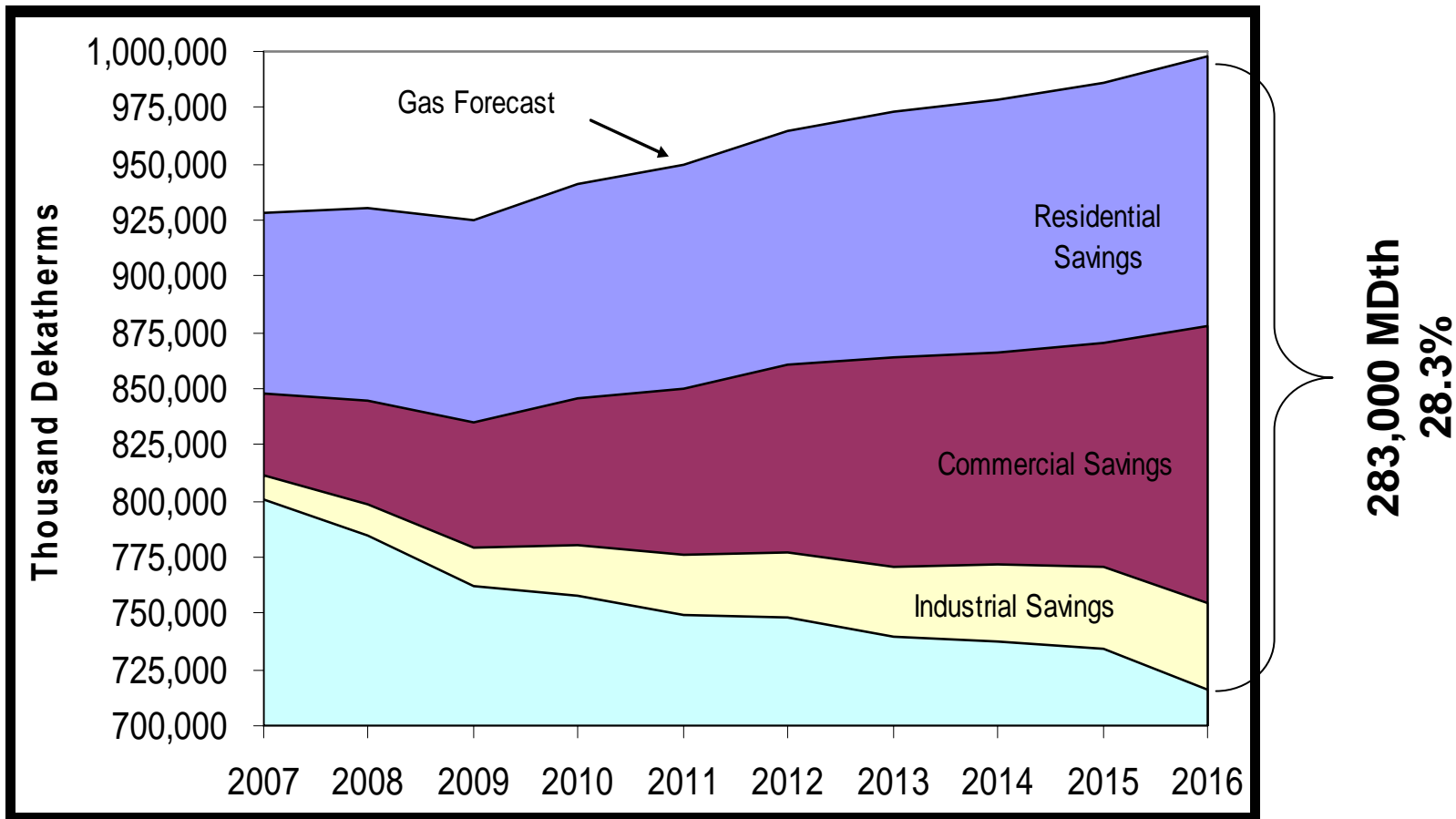
- Impacts and economics analyzed and presented separately for:
 - Sectors
 - Years
 - Building types
 - New construction
 - Existing lost opportunity
 - Early retirement
 - Measure
 - Program

Case Study: New York — Electric and Gas Potential — So What?

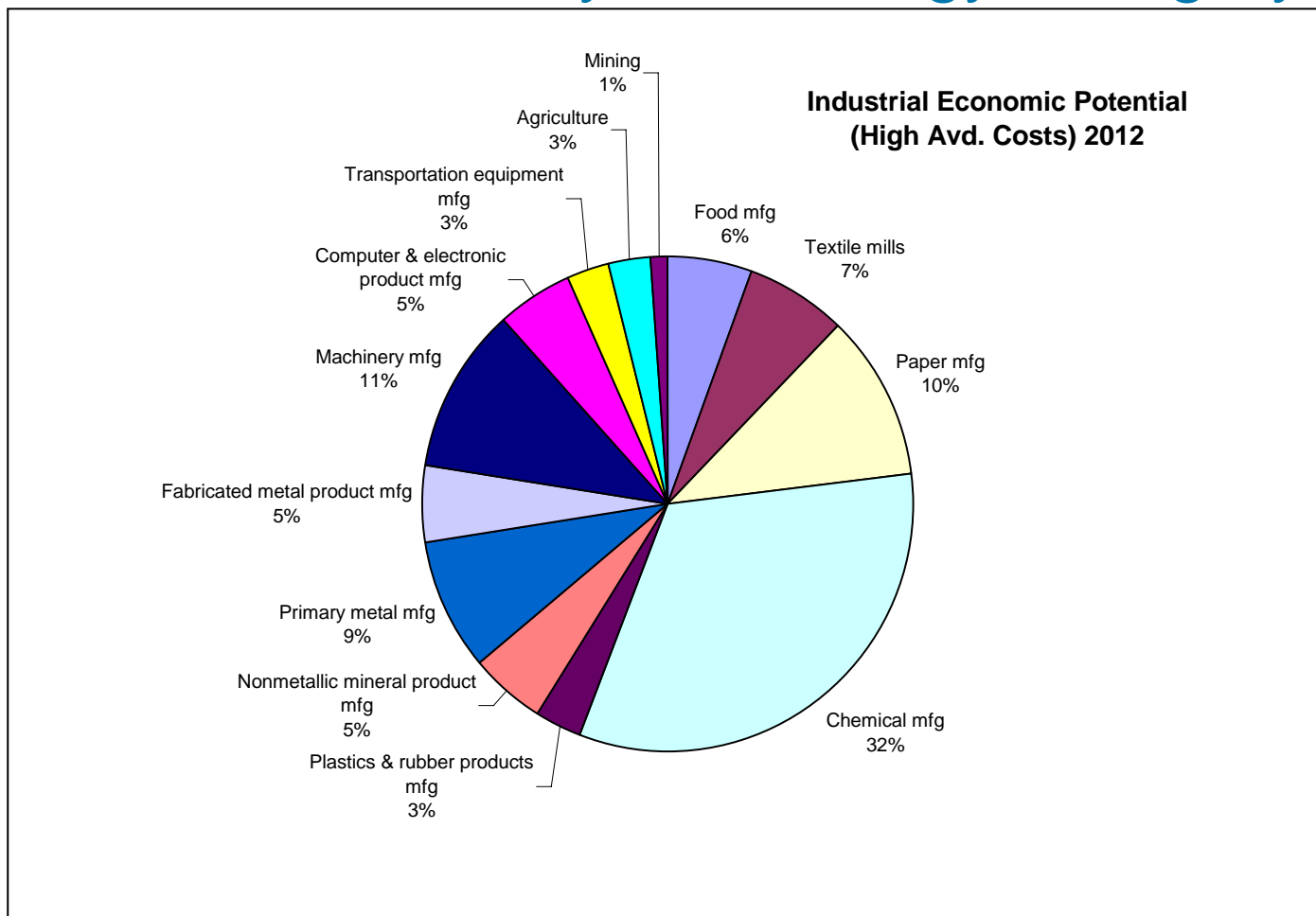
- ▶ State government used to intuit achievable potential and set goals
 - 15% by 2015
 - Political process, not analytical
 - Overarching goal — Can we get there?
- ▶ Detailed data can support finer level of analysis and policy resource allocations — may still be used for that
- ▶ To date, precision and level of detail not relied upon for policy decisions
- ▶ Will be instrumental in supporting decision-making on funding, goal setting, program design, and resource allocation.

Case Study: New York — Gas Example

Overall Sectoral Potential



Case Study: New York — Electric Example: Industrial Potential by Technology Category

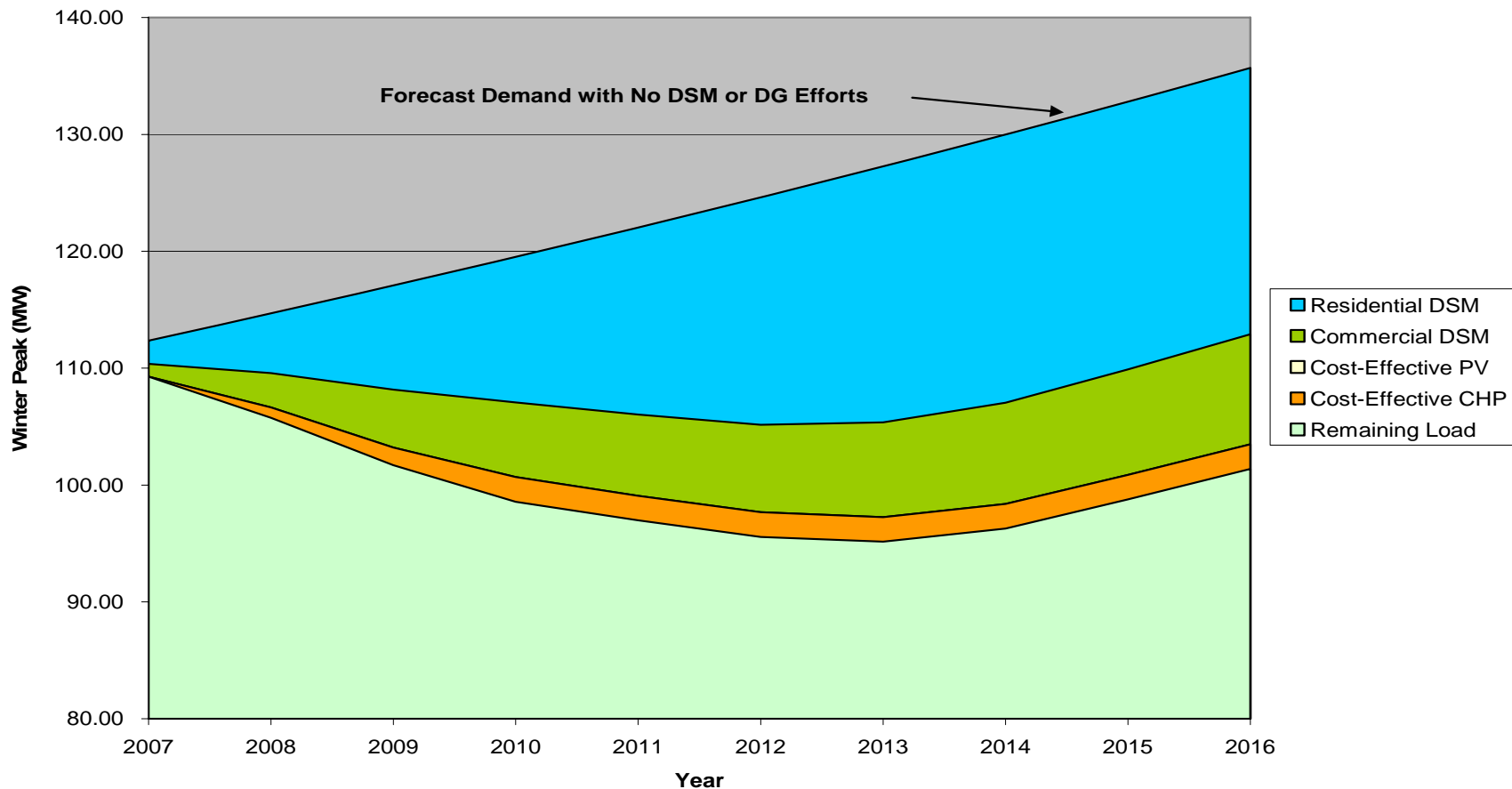


Case Study: VT Transmission Reliability Study

- ▶ **Why:** Vermont Southern Loop T&D Reliability Concerns
 - Winter peaking reliability problem
 - Need to assess DSM alternatives to T&D upgrades
- ▶ **How:** Detailed Analysis
 - Small area — need for detailed customer data and investment grade analysis — law of averages may not apply
 - Special attention to small number of major loads
 - Space and water heating fuel switching options
 - Need to understand future expansion plans for ski areas, industries
- ▶ **So What:** Program Achievable Potential Scenario
 - Modeled specific programs under consideration for delivery
 - Detailed budgets and ramp-up rates
 - Inputs to detailed Transmission IRP analysis

Vermont T&D Scenario

Winter Demand Forecast with Southern Loop Results



Conclusions

- ▶ Demand-side resources can and will be part of future energy solutions.
- ▶ Potential studies are critical to modeling DSM as a resource.
 - How large are the opportunities?
 - What are they worth?
 - How quickly can we get them?
 - What will it cost, and what non-dollar resources are needed?
- ▶ Need to fully understand purpose and use of information before developing work plan.
- ▶ Methods should be driven by purpose and data.
 - May need to collect primary data
 - May be fine to do high level study, borrowing from existing knowledge base — **How** will always depend on **Why** and **So What**

A Why and How Resource



- ▶ U.S. EPA National Action Plan for Energy Efficiency
 - Guide for Conducting Energy Efficiency Potential Studies
 - Forthcoming guide for policy makers and others
 - Assists in identifying need, purpose, type of study, data, methods, uses, and contracting guidance
 - <http://www.epa.gov/solar/actionplan/resources.htm>

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