Task 2: Baseline and targets

November 11, 2016

November Energy Innovation Task Force Meeting

Overview

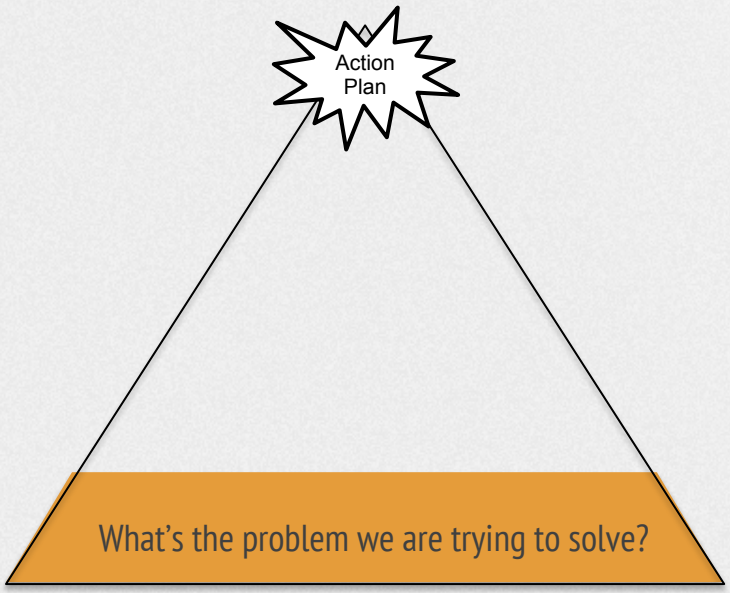
- **Defining the problem we're trying to solve**
  - *WNC peak demand:* What does the Western NC peak demand look like?
  - *Resource need:* Why is Duke Energy Progress proposing a peaker?
  - *Targets:* To defer the peaker, how many peak MW must we offset or reduce?

- **What does that mean?**
  - *Solutions can address the target*: How can solutions offset/reduce the peak?
  - *Forecasts of existing programs*: What is the baseline for existing programs?
  - *Beginning to refine our solutions*: What might a portfolio of solutions look like?

Defining the problem clearly establishes the foundation for other work

The "Baseline and target development" task (Task 2) supports the ***EITF's efforts to create an actionable strategy that works for and with this community*** by clearly defining:

- How much needs to be done
- Where are points of leverage to guide solution selection

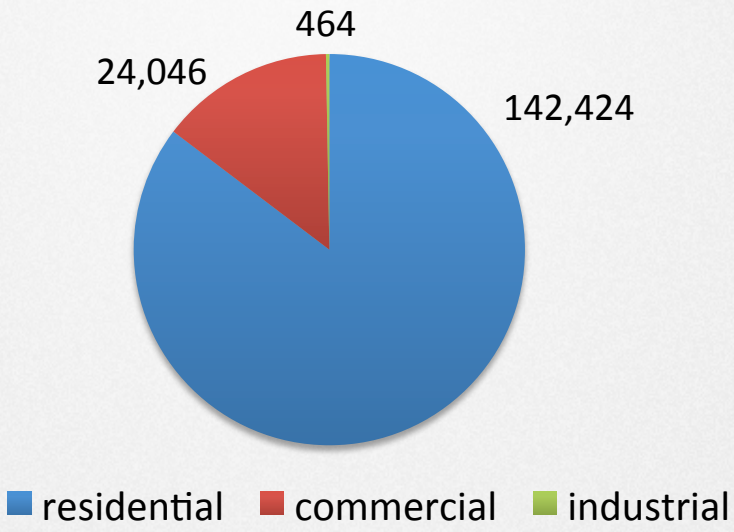


- Task 2 Objectives:
  - Define the annual targets that must be met to displace the peaker plant
  - Perform a baseline analysis to identify current and anticipated regional peak demand and its drivers
  - Share insights and understanding with the EITF
- Task 2 Key Outputs:
  - Results of baseline analysis
  - Targets presentation
  - Overview of, and insights into drivers of need for peaker plant, including geographical boundaries and customers that can help provide solutions

The WNC region served by Duke Energy Progress (DEP) totals 167,000 customers across 9 counties

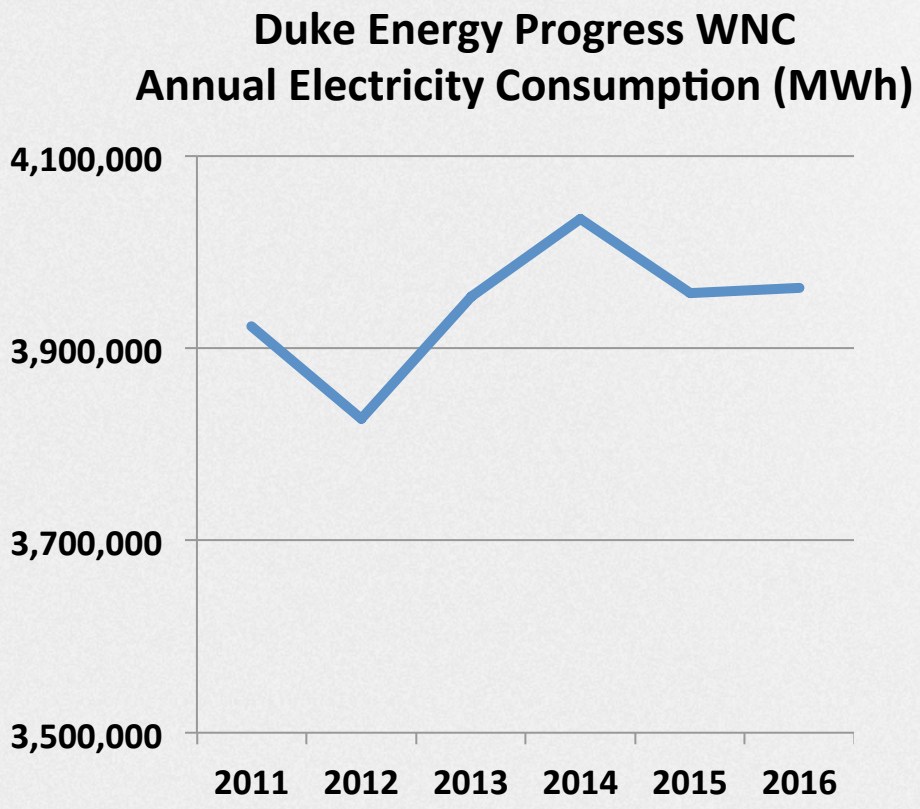
Source: Duke Energy Progress Service Territory Map

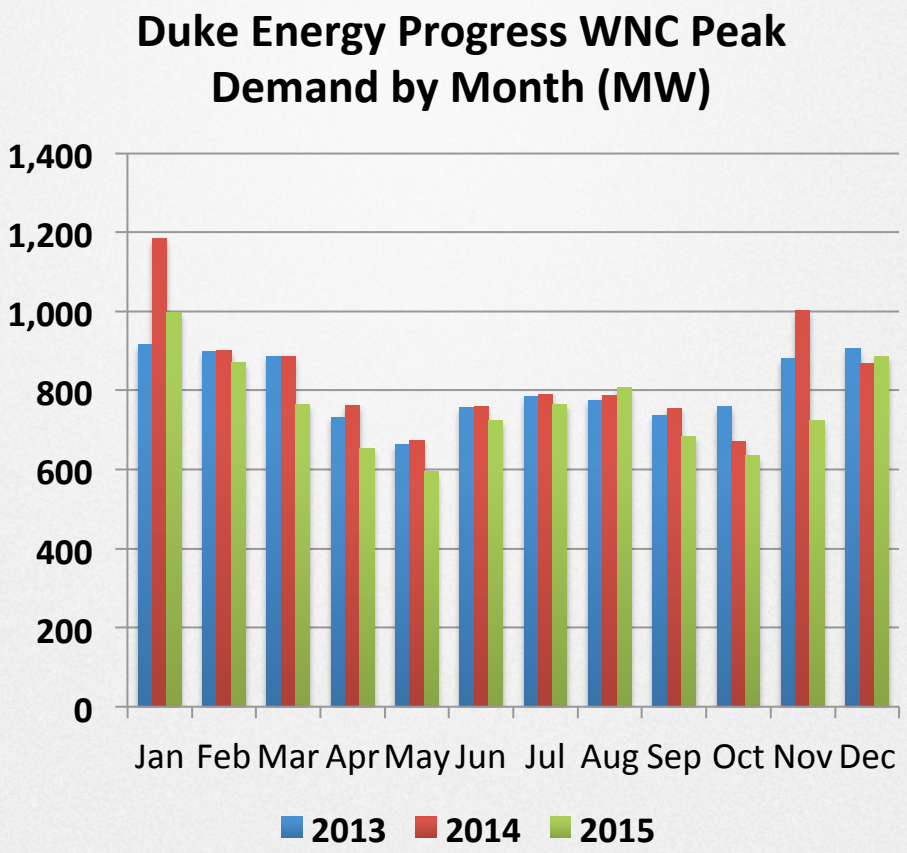
As of 2015, the region had 166,934 retail customers



Historically, the region has experienced electricity demand growth

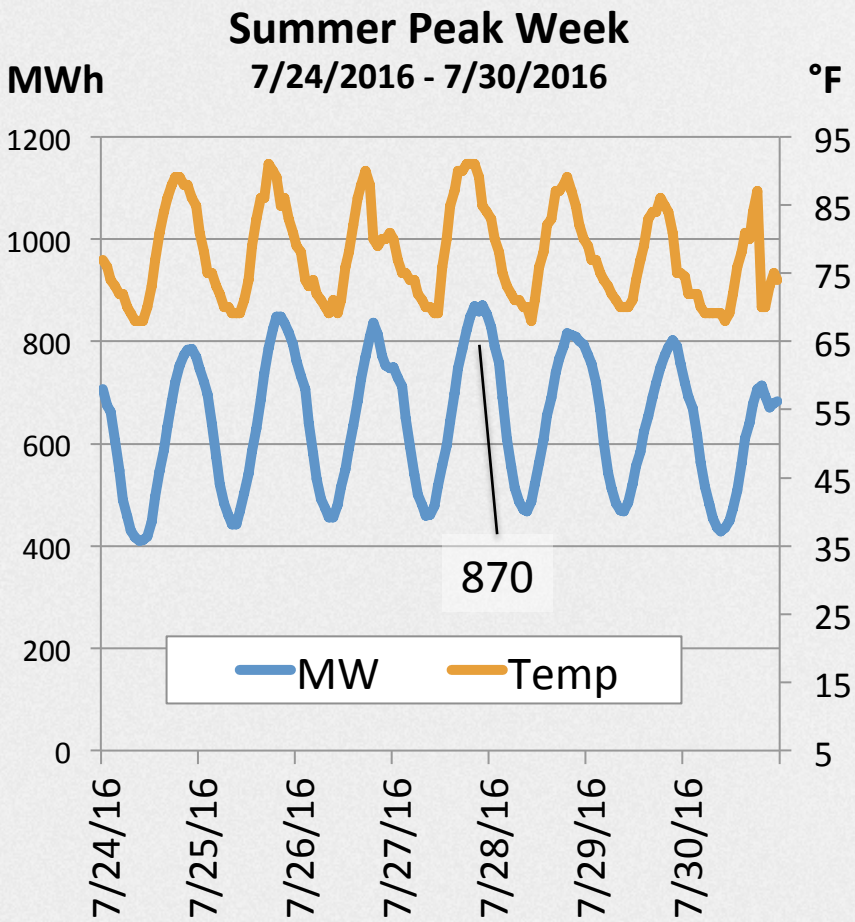
Since 1970, regional electricity demand has increased 1% per year, and peak power demand has more than tripled in the DEP-Western Region.

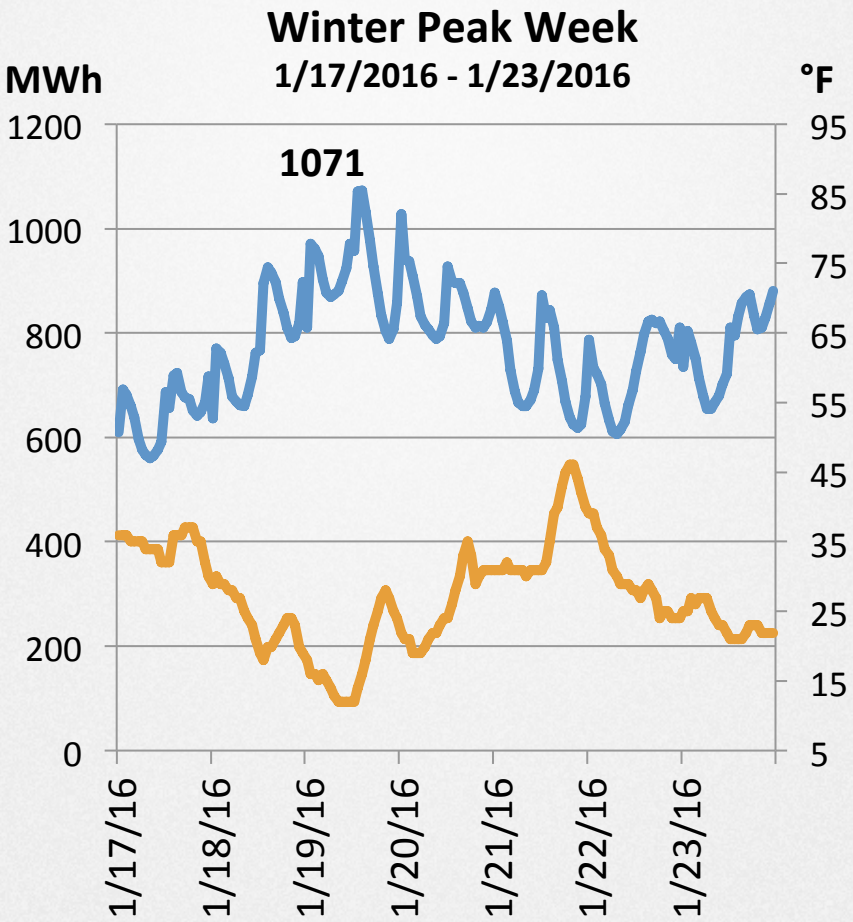




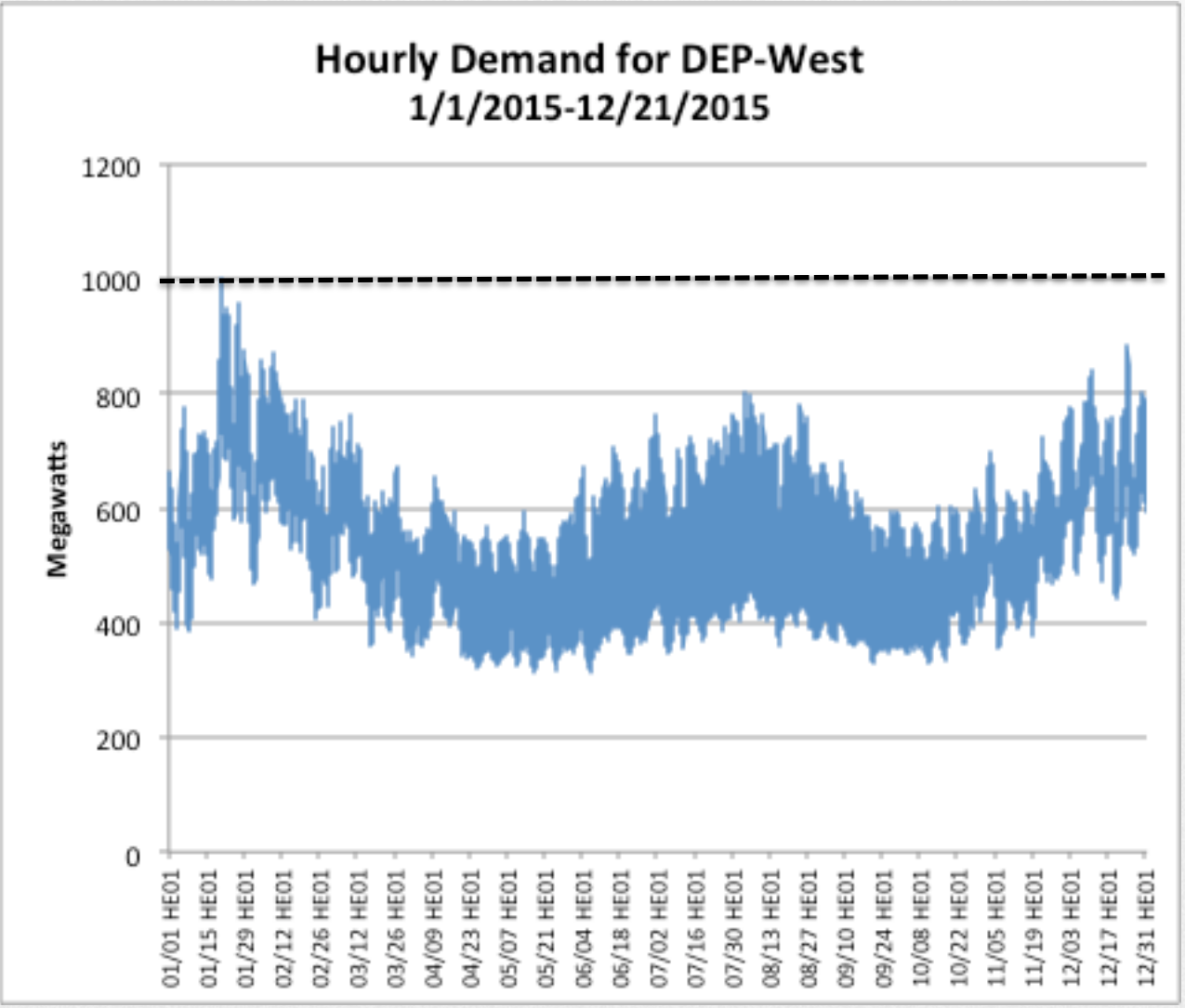
Source: 1. DEP CPCN p. 8

WNC's mountainous climate means the region experiences peak electricity usage in summer and winter





Critically, the WNC region's system system peak occurs in the winter

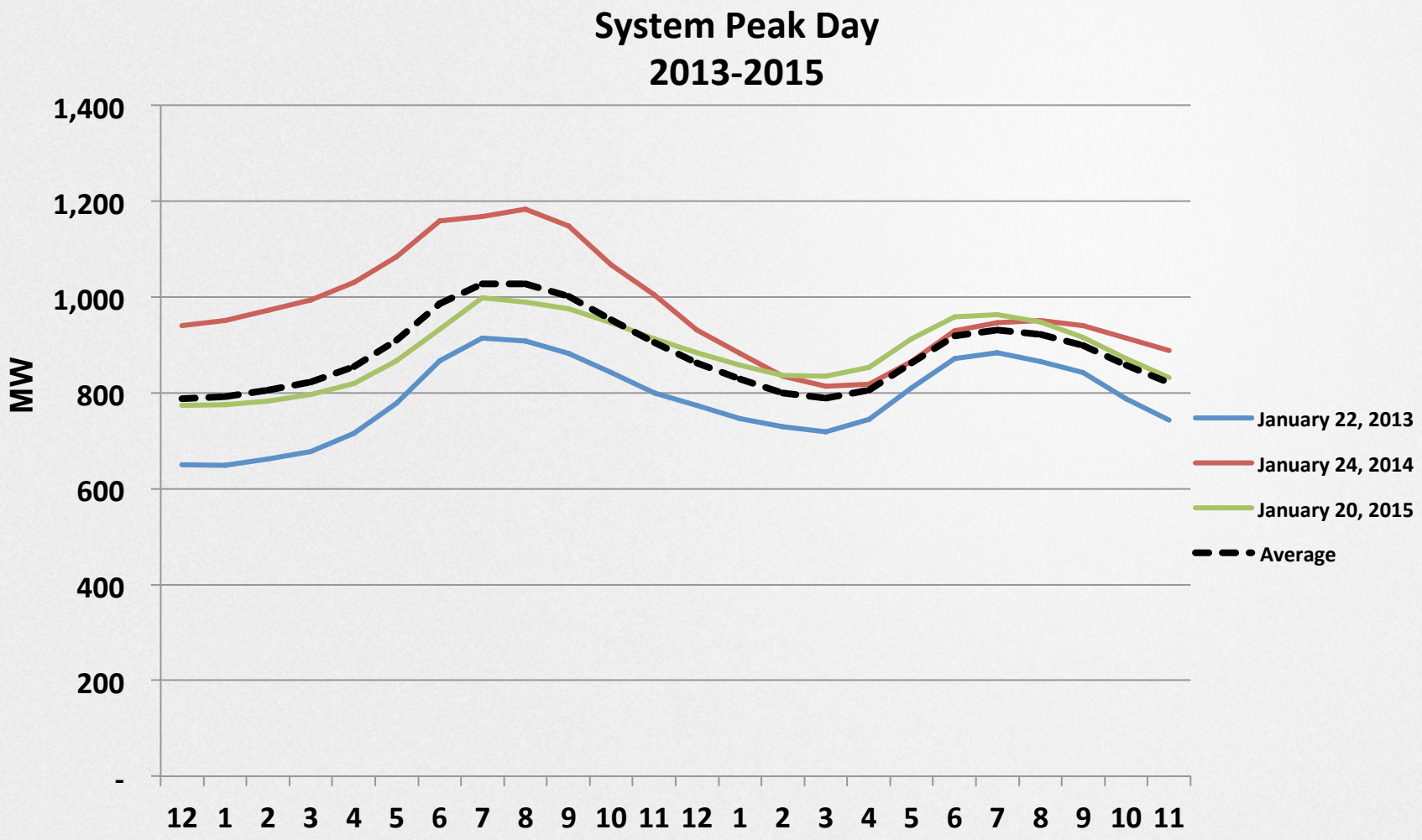


- **Of the 10 highest periods of electricity demand, all were in the winter**
- **This year, winter peak was 998 MW, or 190 MW higher than summer of 808 MW**
- **In 2015, WNC demand was greater than:**

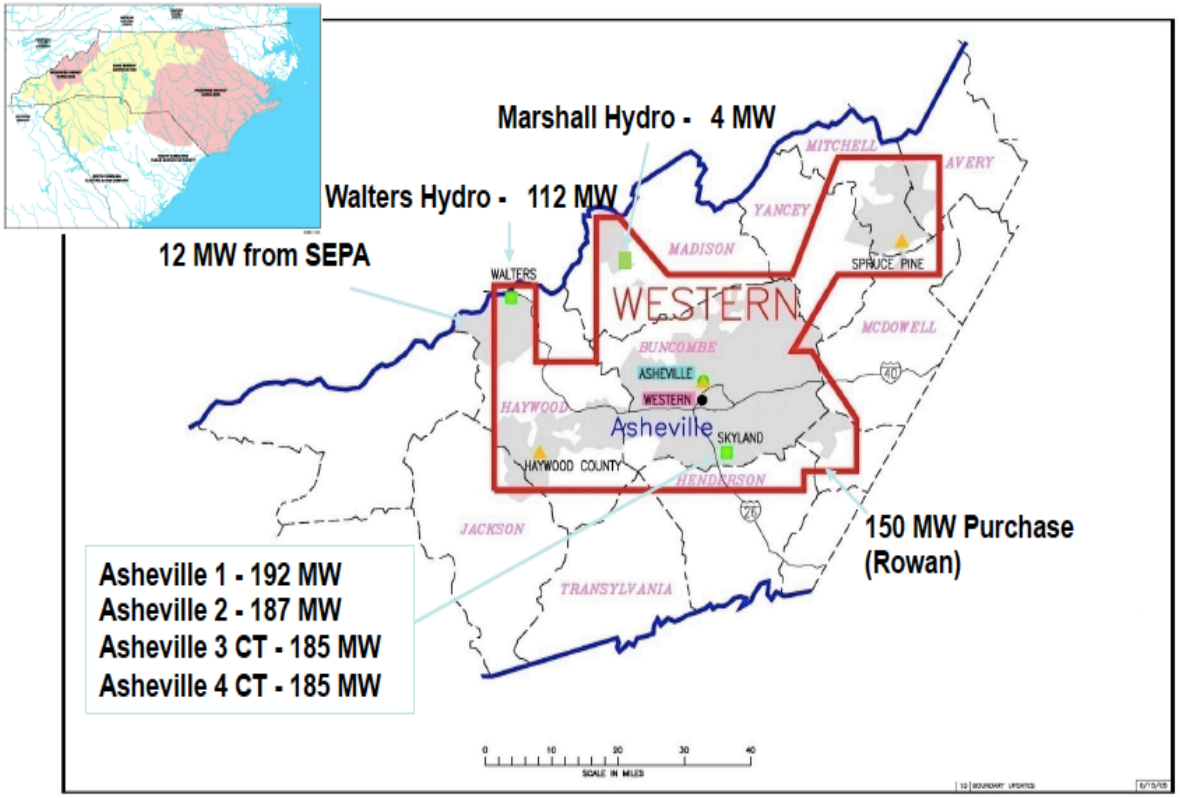
  950 MW during 6 hours

  900 MW during 26 hours

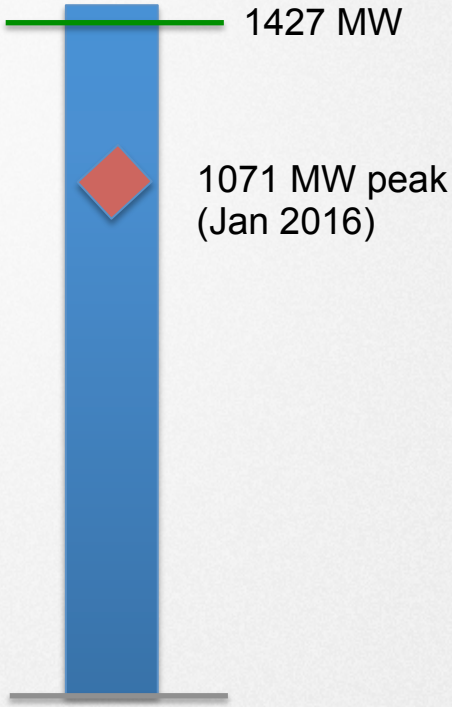
Daily load shapes during system peak show two peaks, the highest in the morning



To meet this demand, the area has ~1,000 MW of supply resources and 400 MW of firm transmission capacity (2016)

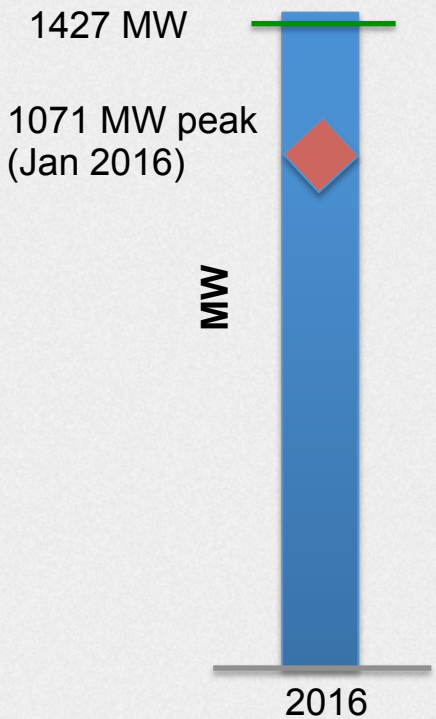


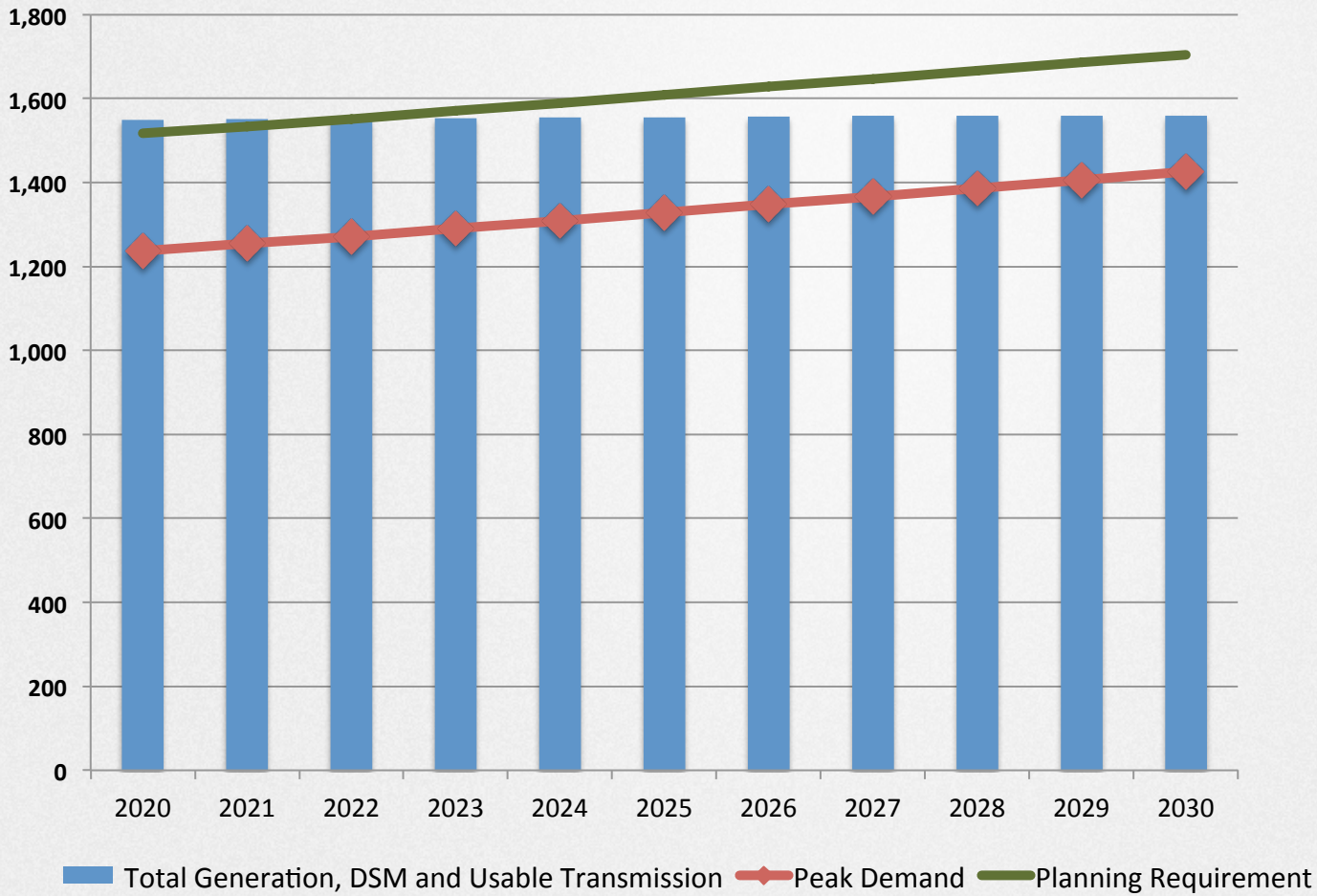
Total available resources – 1,027 MW plus 400 MW of firm E-W transmission



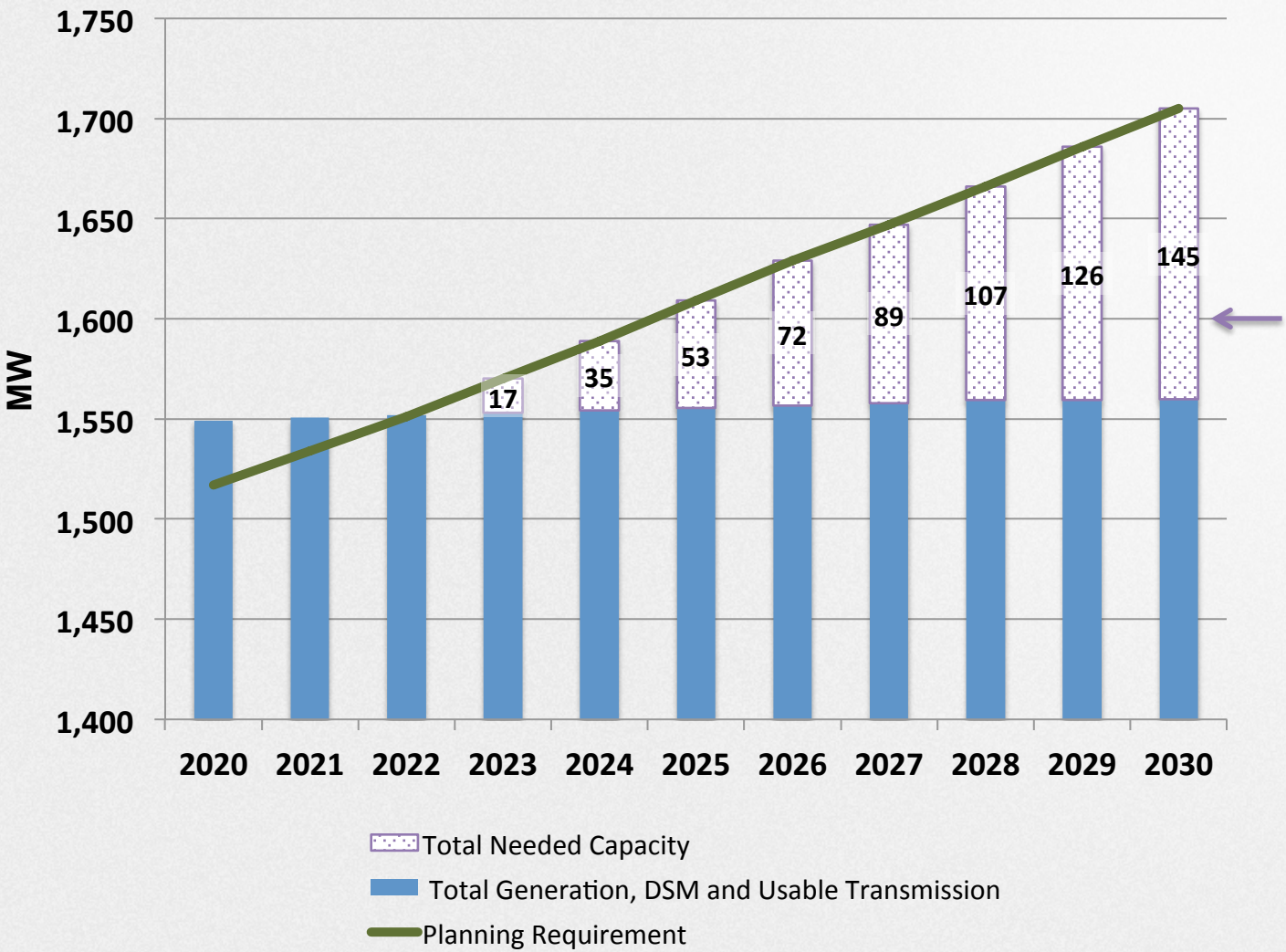
Total available resources include a planning requirement that is based on peak load, and includes reserves in case there is a problem

The planning requirement, which is based on peak demand, sets the required amount of resources



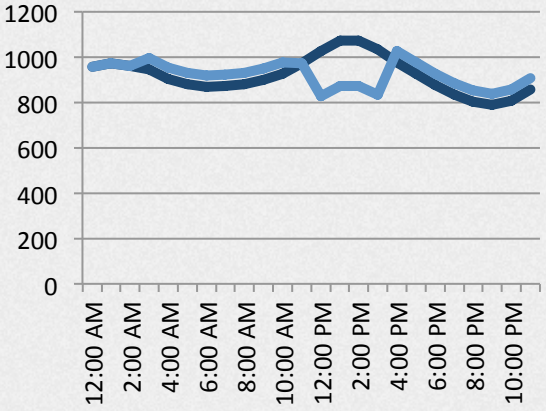


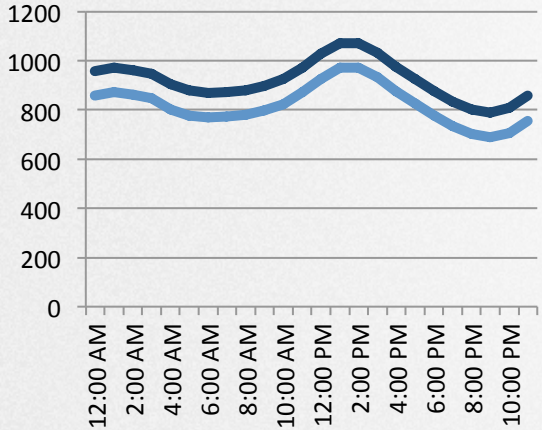
WNC is projected to have a capacity shortfall of 17-19 MW per year starting in 2023

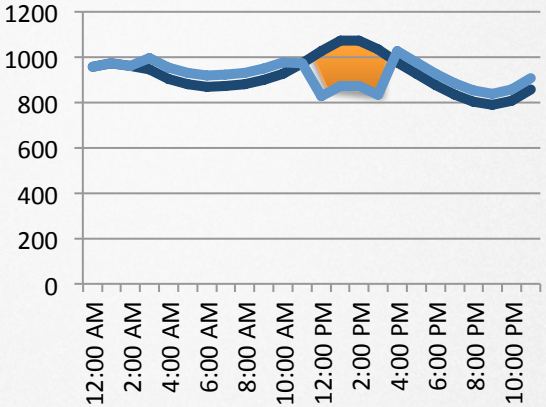


Annual targets are defined by the shortfall of available resources in meeting the planning requirement

To be successful in deferring the peaker plant, we need to create peak offsets to meet or exceed the target MW





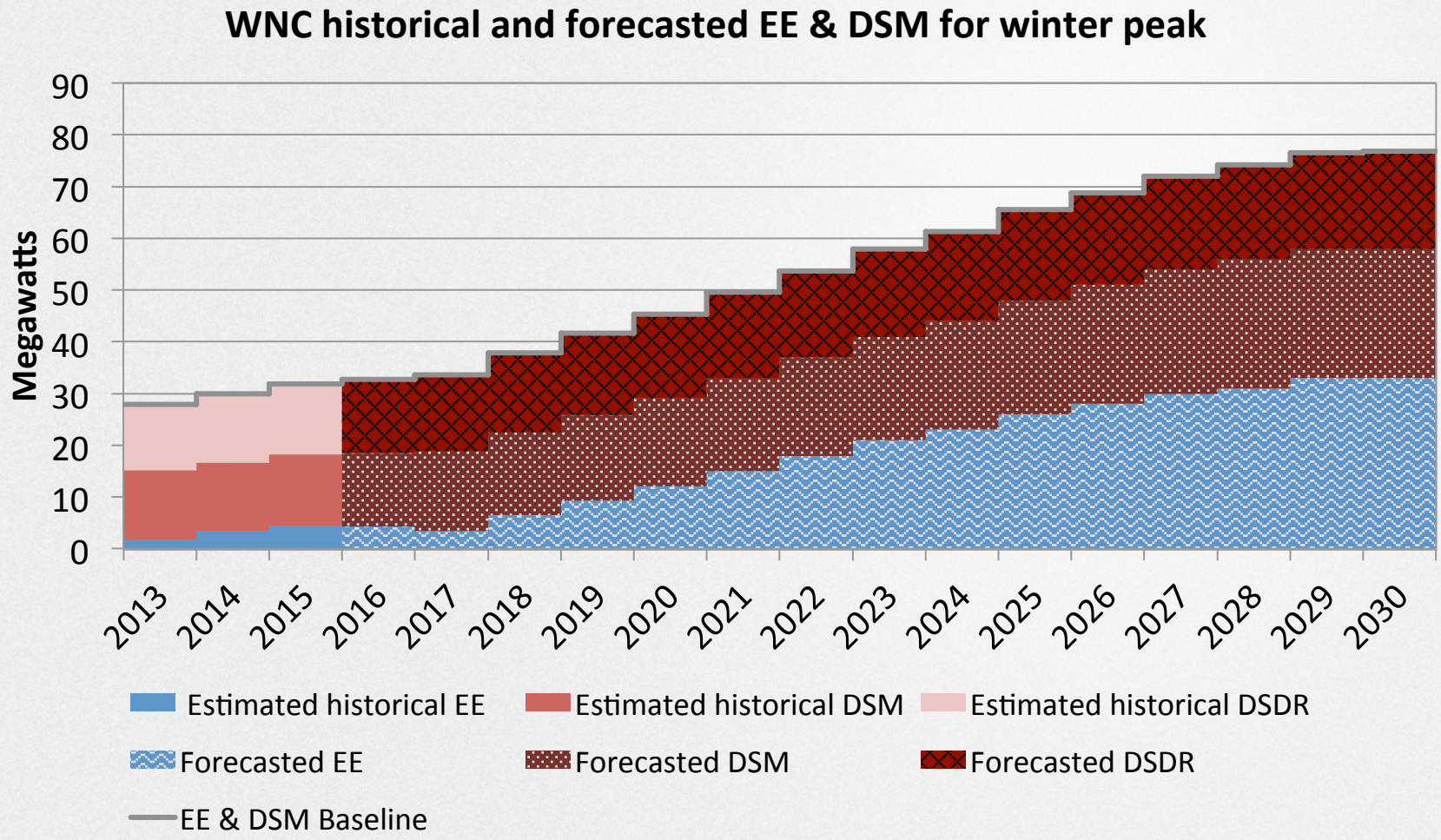


Our goal is to address the peak through energy efficiency, demand management or locally based generation

Its helpful to contextualize 17 MW per year: What does that mean?

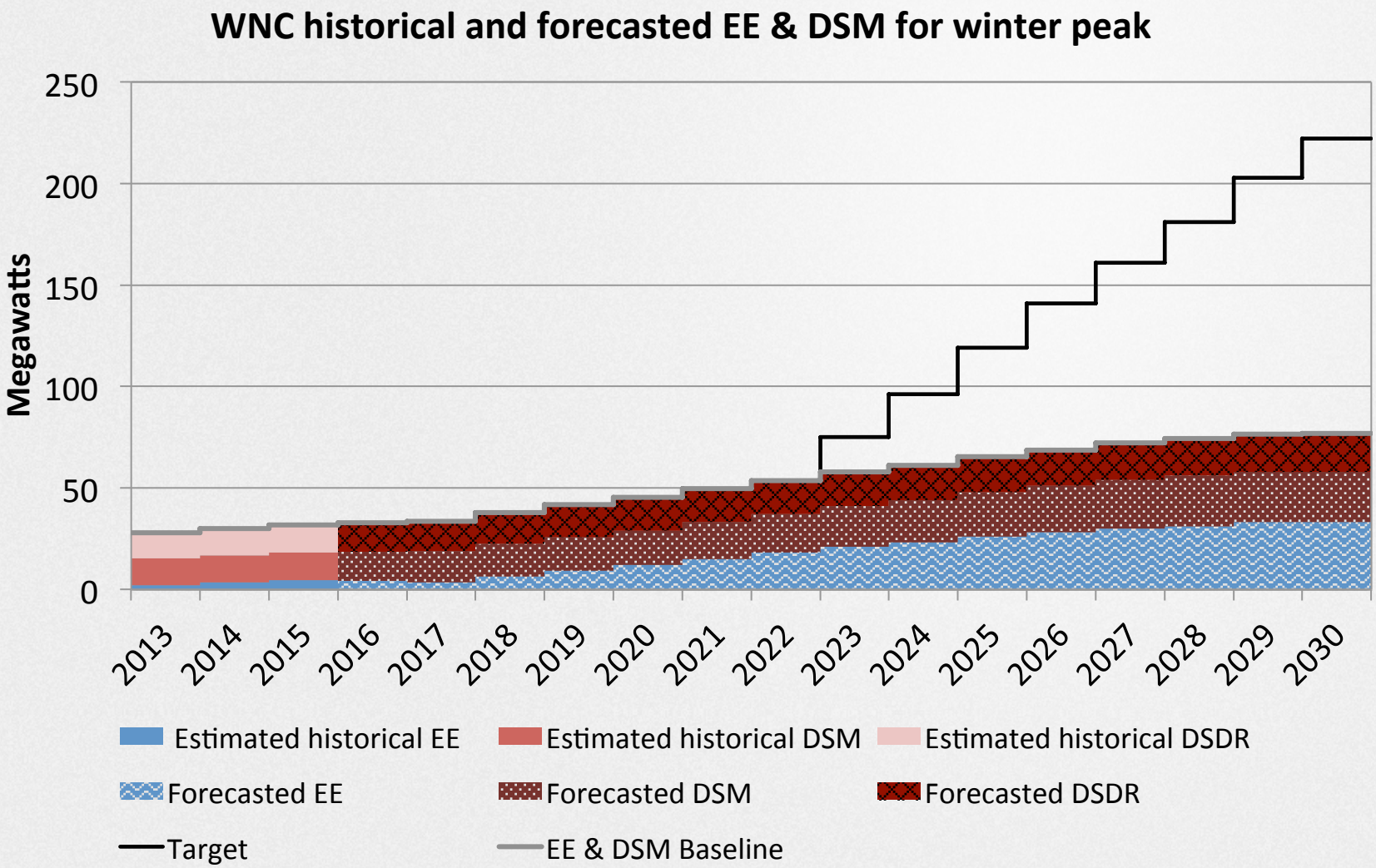
- Is it possible?
- How big of a lift would it be?
- What would achieving these targets look like?

DEP forecasted DSM and EE growth sets the baseline

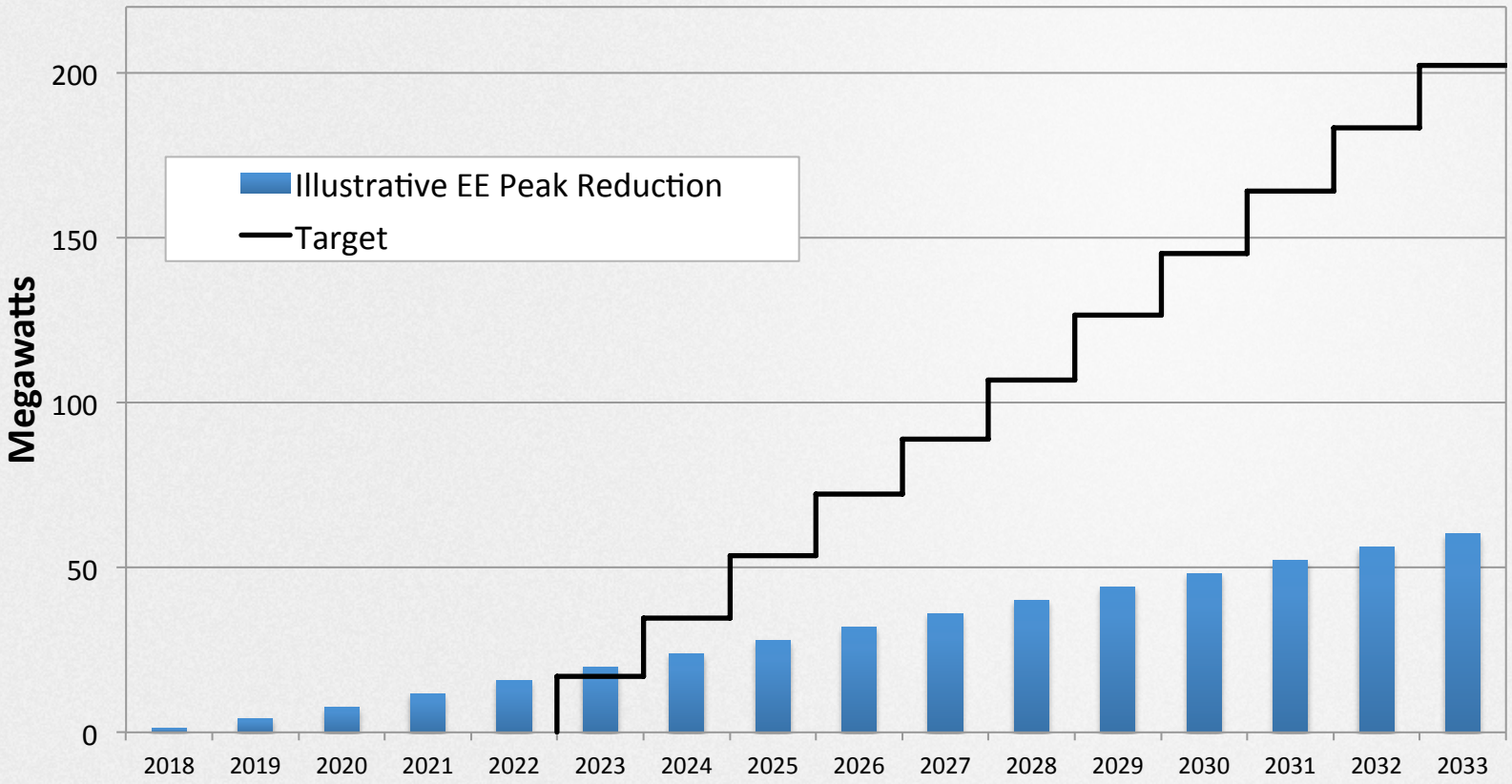


Sources:
Historical – estimated based on DEP energy efficiency rider docket (e-2 sub 1108), DEP IRP, Duke Energy Progress WNC Plan updated for 2016 IRP

Solutions to address the target must be incremental beyond the DEP's forecasted baseline

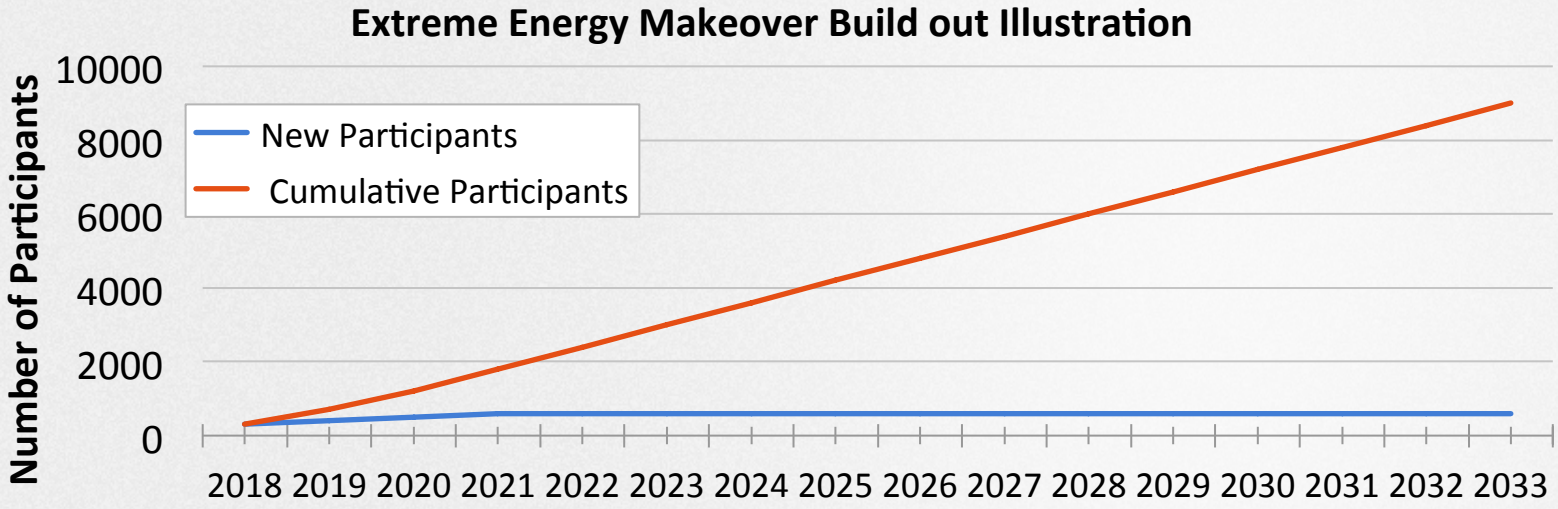


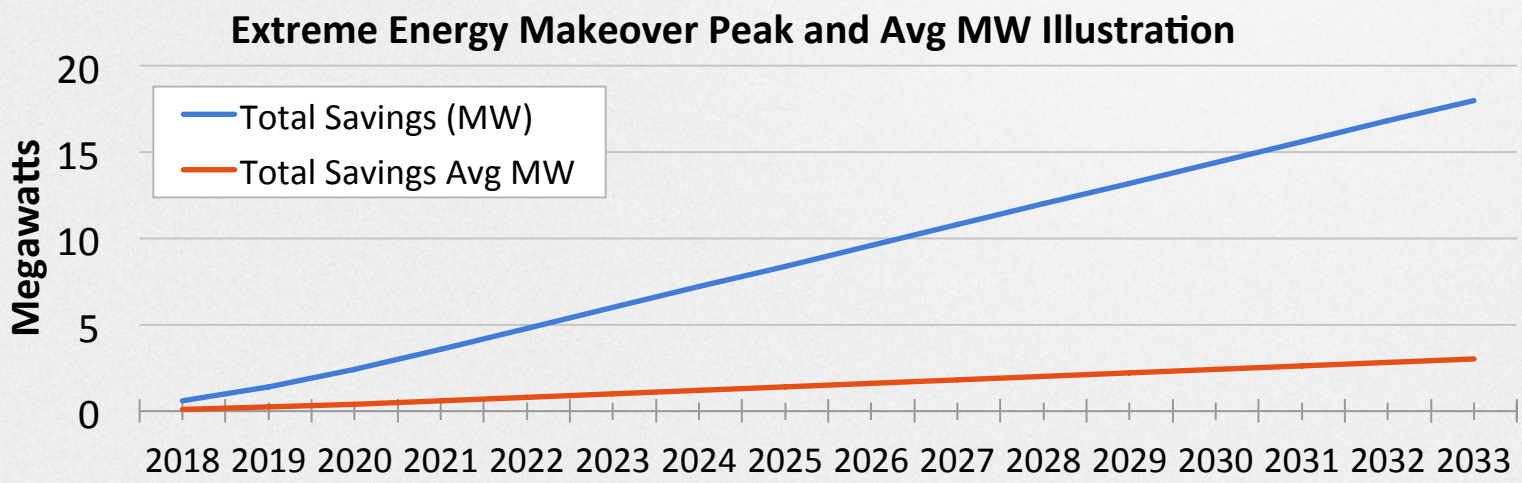
The portfolio of solutions will include energy efficiency



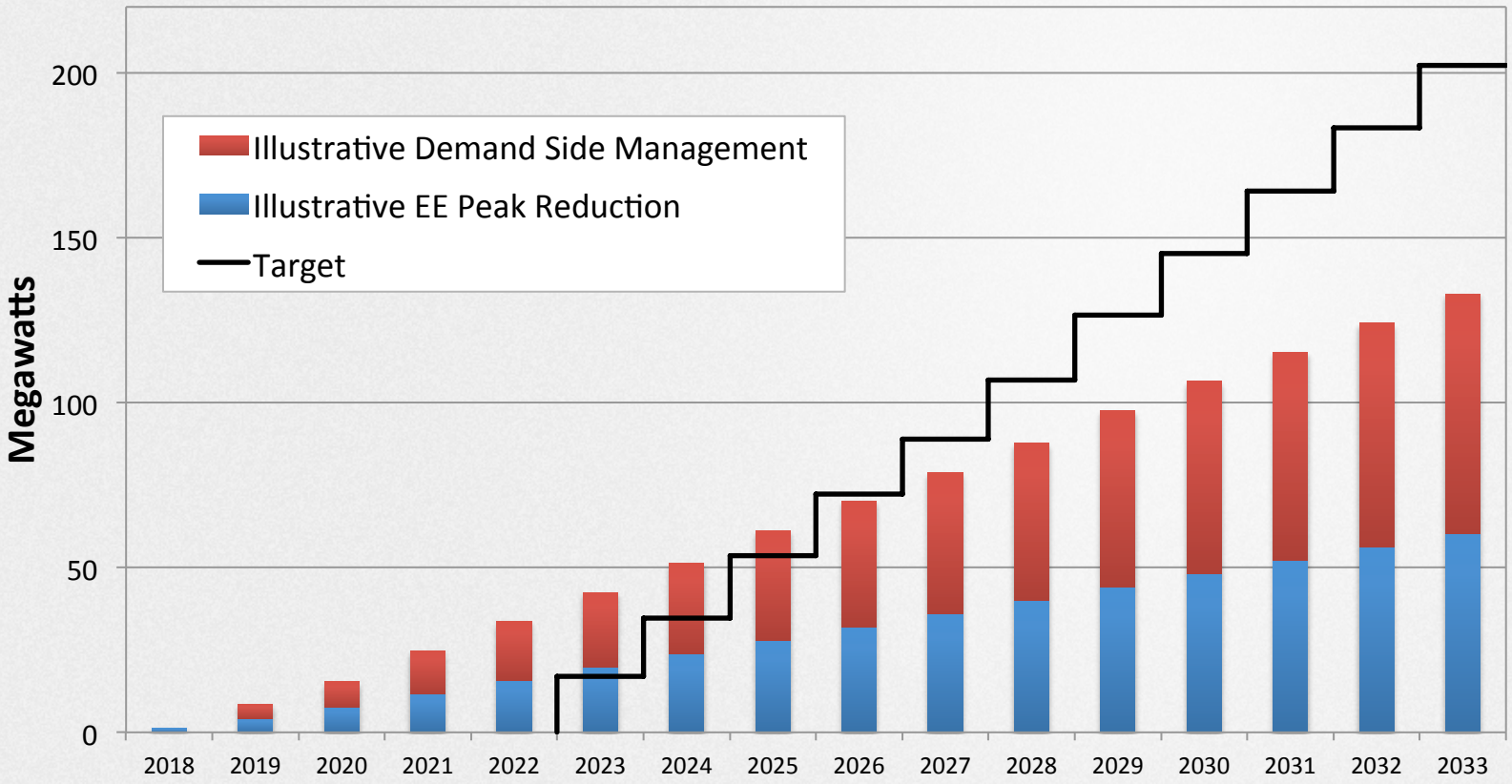
- Low Income Extreme Energy Makeover
- Expanded heat pump water heater
- On bill financing
- Energy Coach Program
- Expanded energy house call
- Promote “My Home Energy”

Each MW of solution towards the target is driven by participation in the community



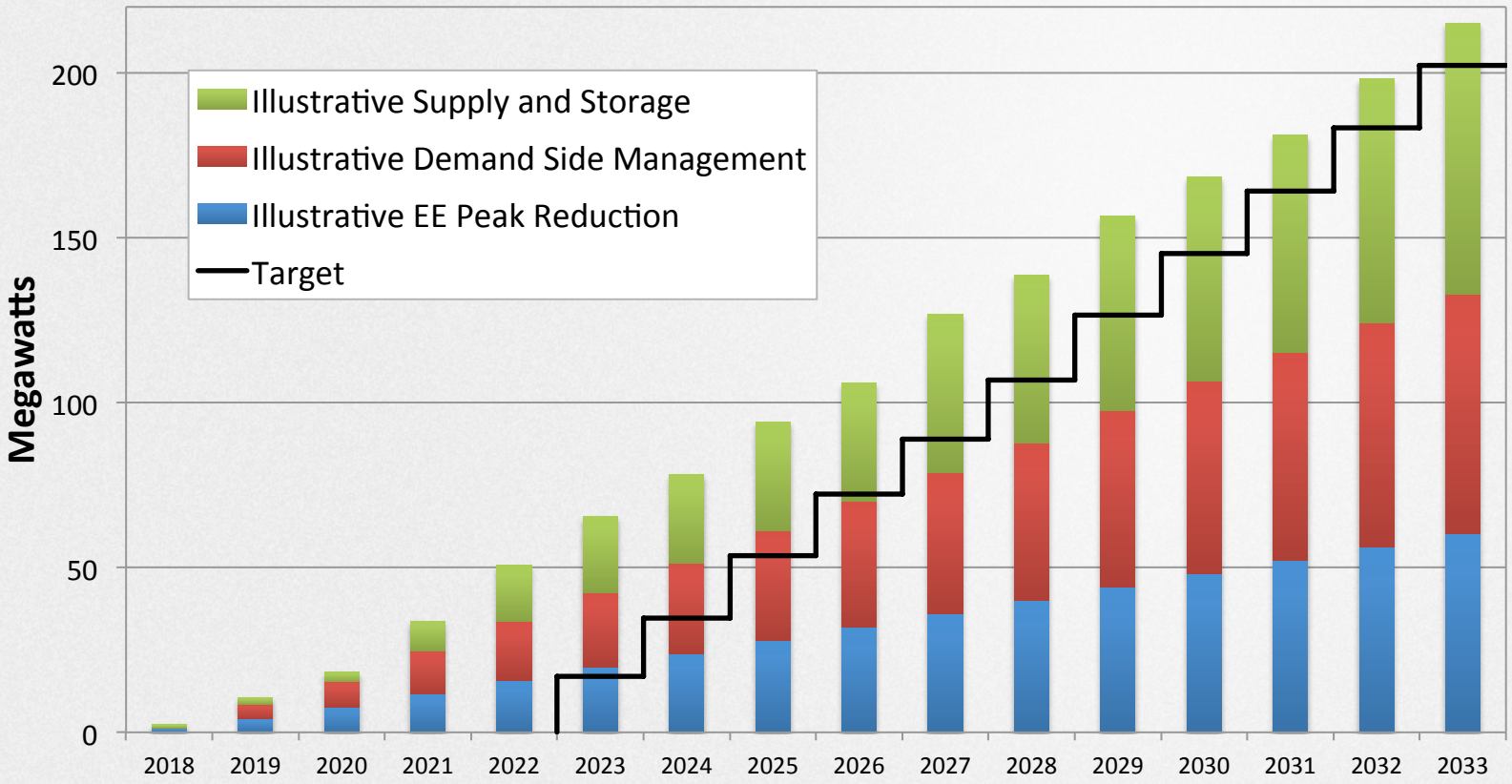


We need to construct a portfolio of solutions, eg demand management



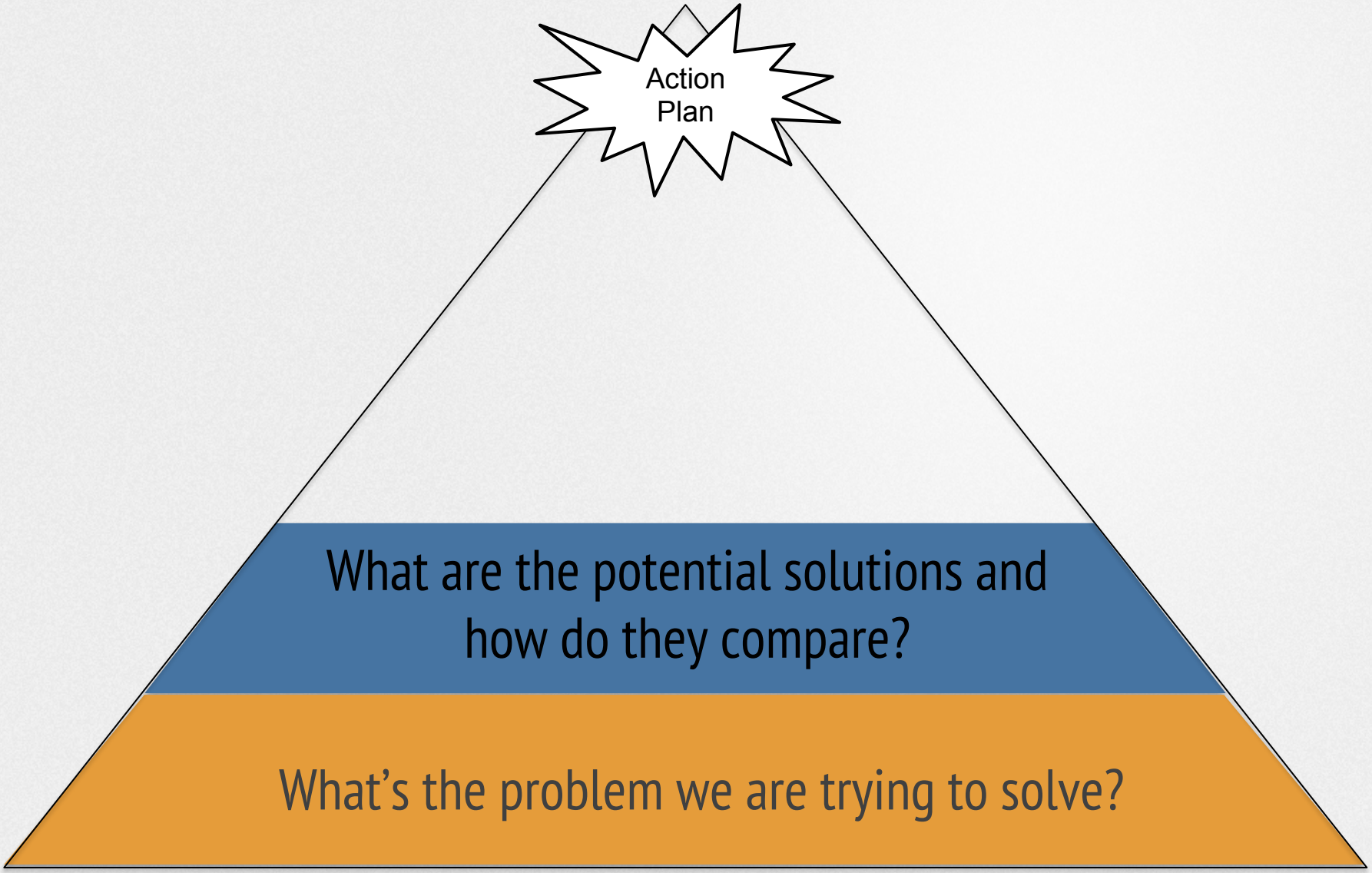
- Expand Residential Energy Wise
- Industrial interruptible load program
- Expand Commercial Energy Wise
- Time of use rates

We need to construct a portfolio of solutions, eg capacity options



- Community and utility scale solar
-Microgrid program
- Added transmission
- Expanded energy storage
- Biomass, low head hydro, wind options
- Combined heat and power

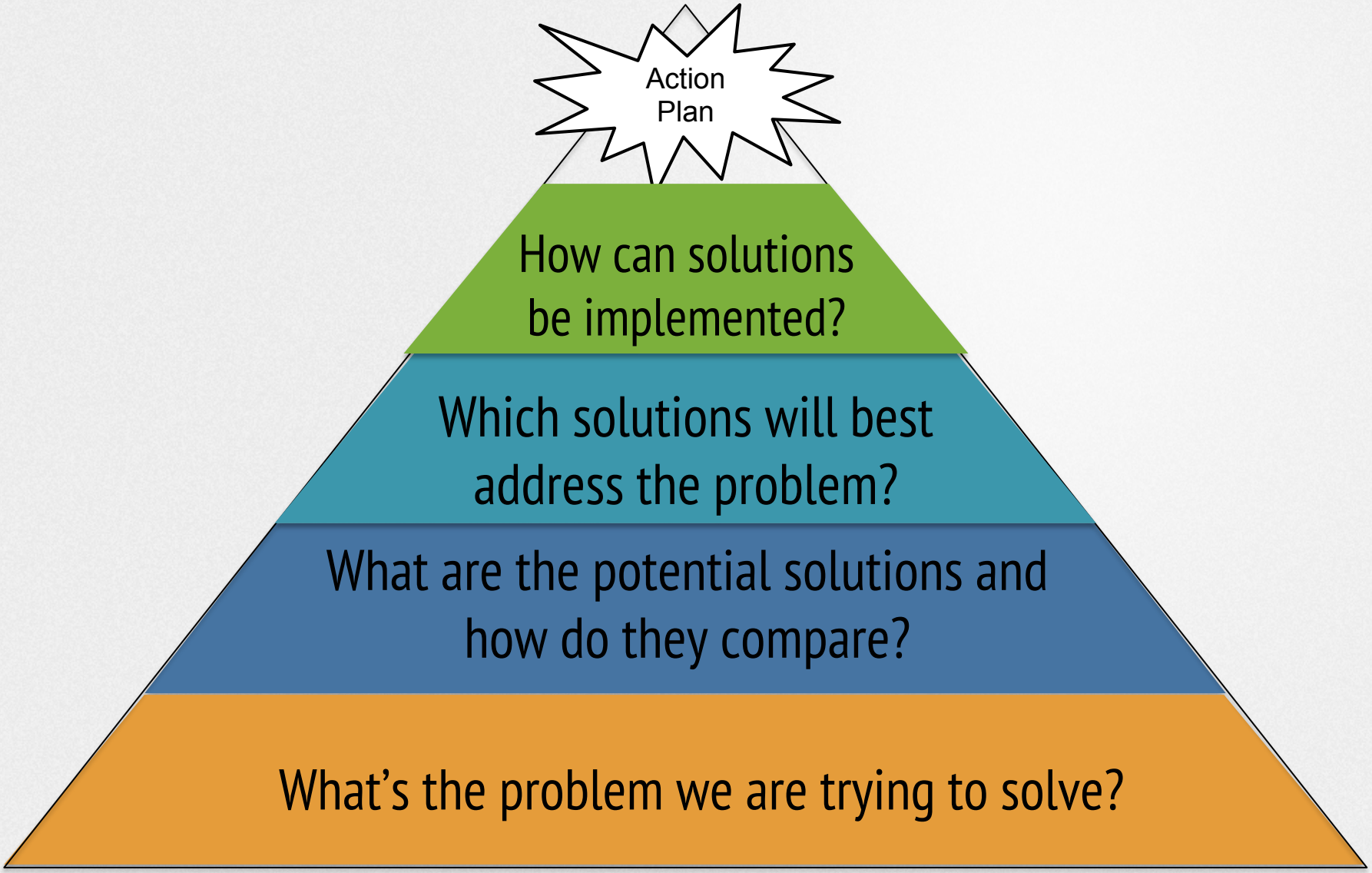
The action plan will require a mix of solutions to meet the target



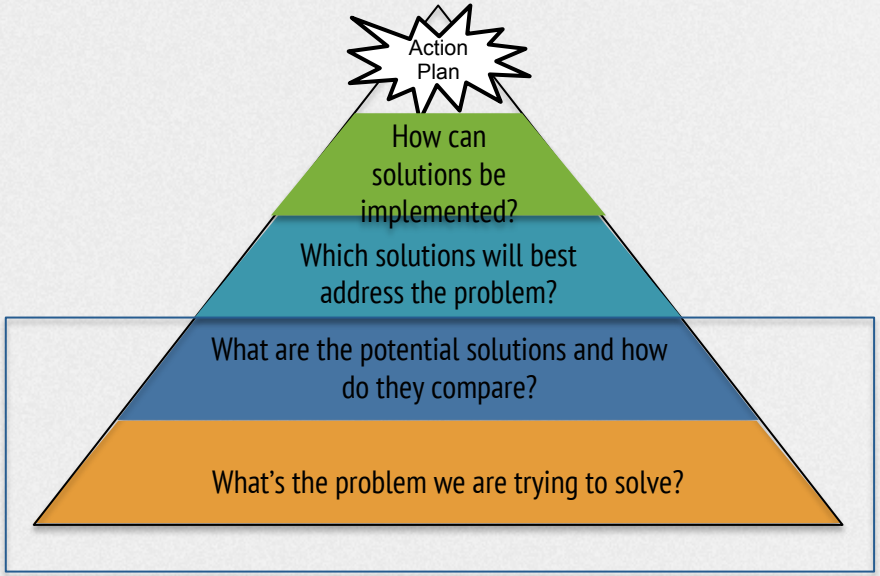
Additional detail

APPENDIX

The overall approach of the EITF



EITF primary focus through December



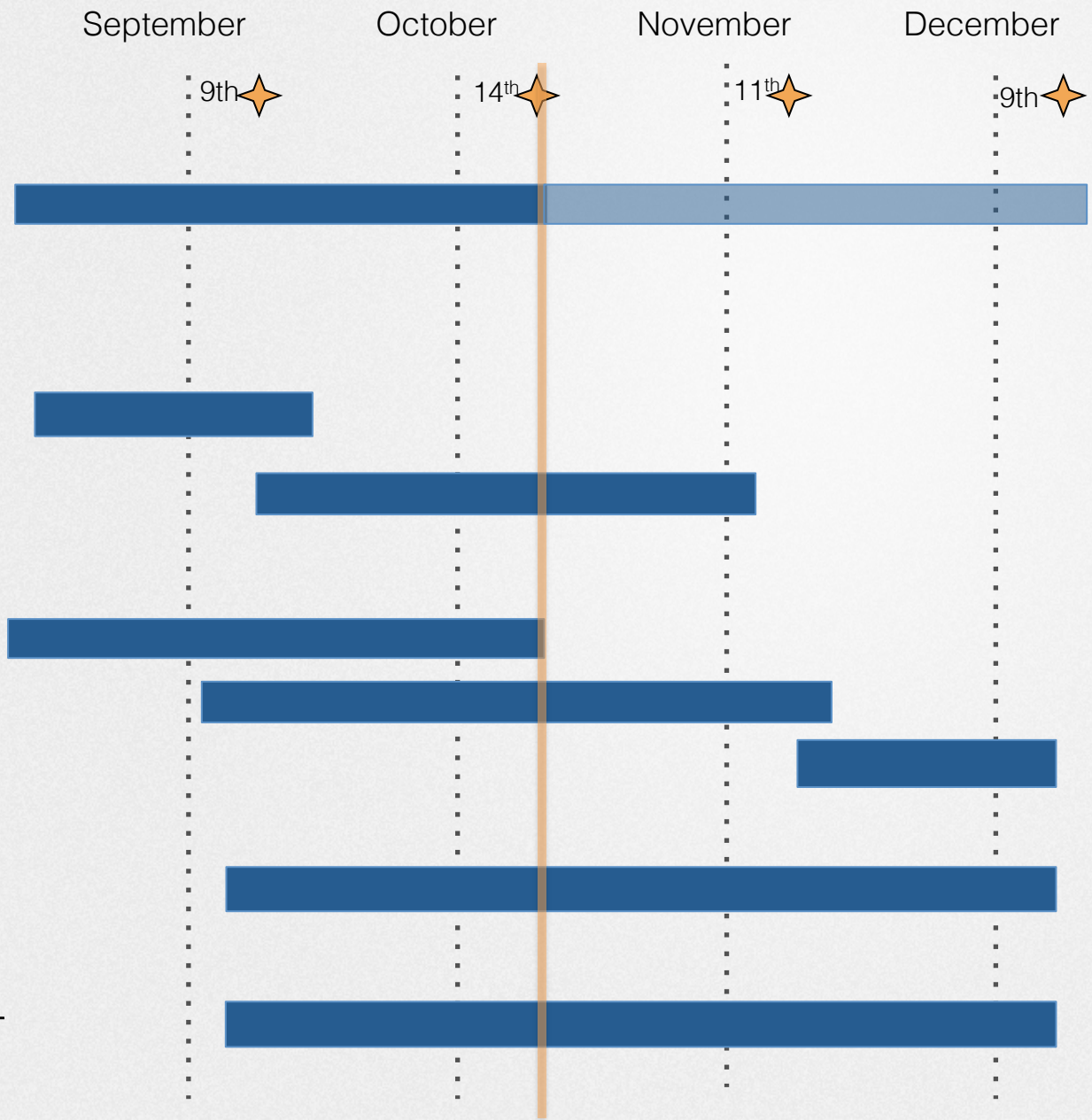
Task 2:
Baseline & Target Development

- Create baseline and annual targets
- Identify primary drivers of energy and peak usage

Task 3:
Solution Identification & Development

- Research and refine potential solutions
- Identify strategies that can accelerate adoption
- Compare solutions/ strategies

Phase I Milestones



Scheduled EITF meetings

Task 1:
PROCESS DESIGN, MGT
- Finalize scope, roles
- Create detailed workplan

Task 2:
BASELINE & TARGET DEV
- Identify needed analysis, data request
- Analysis: baseline & target development

Task 3:
SOLUTION IDENTIFICATION
- Catalog ideas to date
- Assess existing program effectiveness
- Identify gaps, new strategies

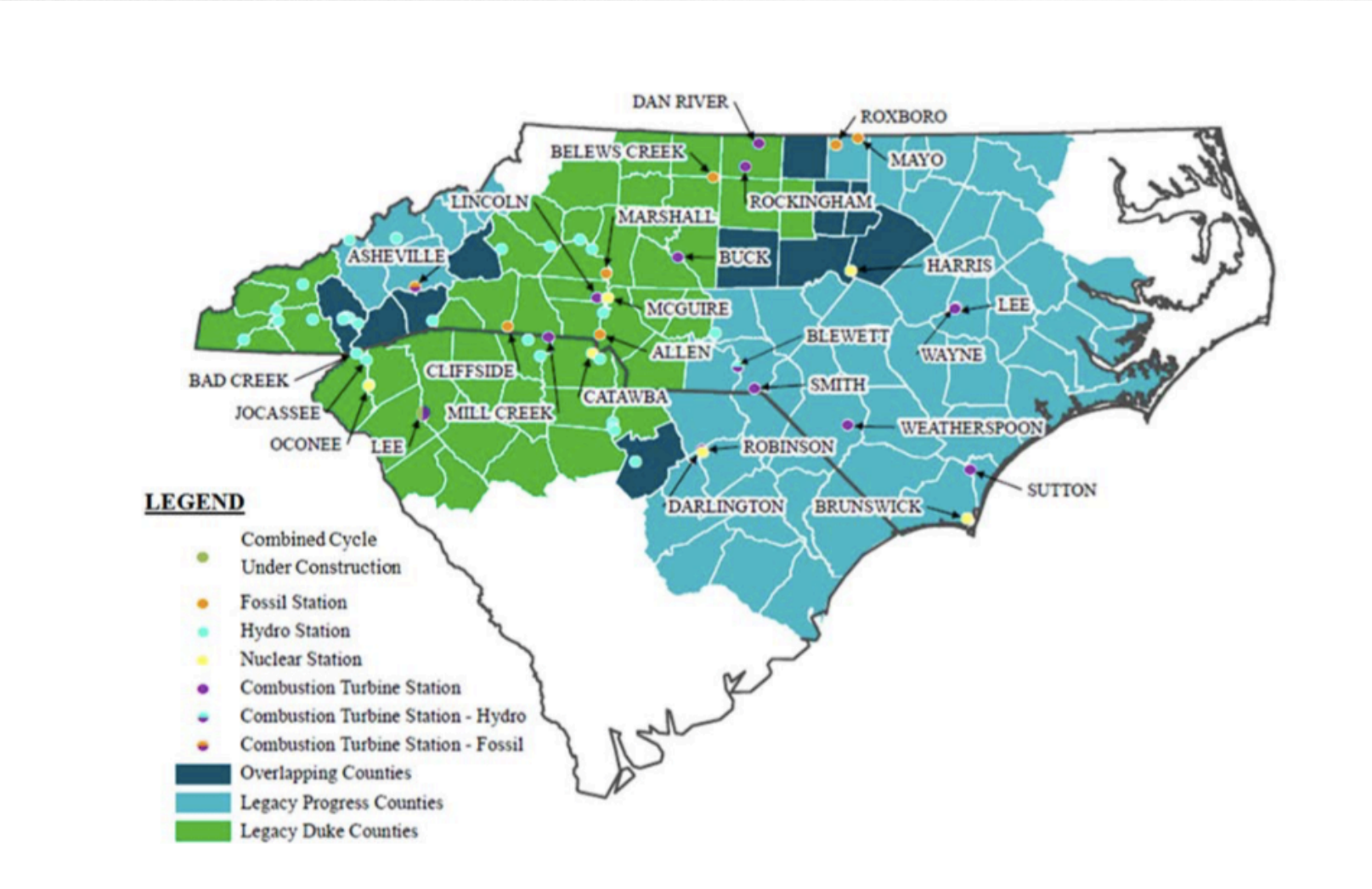
Task 4:
STRATEGY INTEGRATION
- Establish framework
- Phase I report out

Task 5:
COMMUNITY ENGAGEMENT
- Catalog existing marketing approaches

Phase I Meeting Milestones

	September 9th	October 14th	November 11th	December 9th
Process design and Project Management	• Review process design & work structure • Mtg with working group chairs on schedule, workflow			
Baseline and Target Development	• Review needed analysis, data request • Schedule mtg with Peaker workgroup, Duke analysis team to discuss schedule, workplan	• Duke/ Peaker Workgroup: Present update: Initial baseline and target development	• Duke/ Peaker Workgroup: Present finalized baseline and targets	Integrate in Phase I strategy report out
Solution Identification and Development		• Programs and Technologies Workgroups: Catalog existing programs; framework of ideas	• Assessment of existing program effectiveness • Identification of gaps, new strategies	
Strategy integration		• Establish strategy framework	• Refine, populate strategy framework	
Community Engagement		• Catalog existing marketing approaches	• Identification of gaps, new strategies • Identify branding firm	

Duke Energy Progress and Duke Energy Carolinas Service Territory



Source: DEP 2016 Integrated Resources Plan