USING ADVANCED ENERGY TO LOWER COSTS AND EMISSIONS

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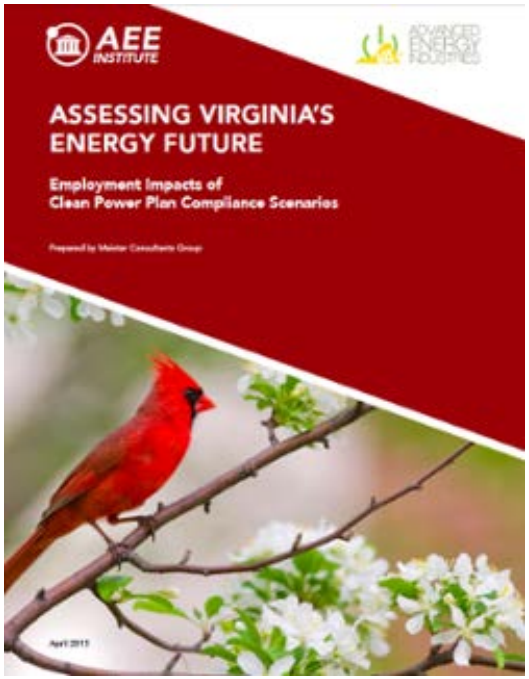
AEE's Membership

Leadership Council

Business Council

Advanced energy already plays a key role in the Commonwealth but has room for growth



Assessing Virginia's Energy Future: Employment Impacts of Clean Power Plan Compliance Scenarios

STEER

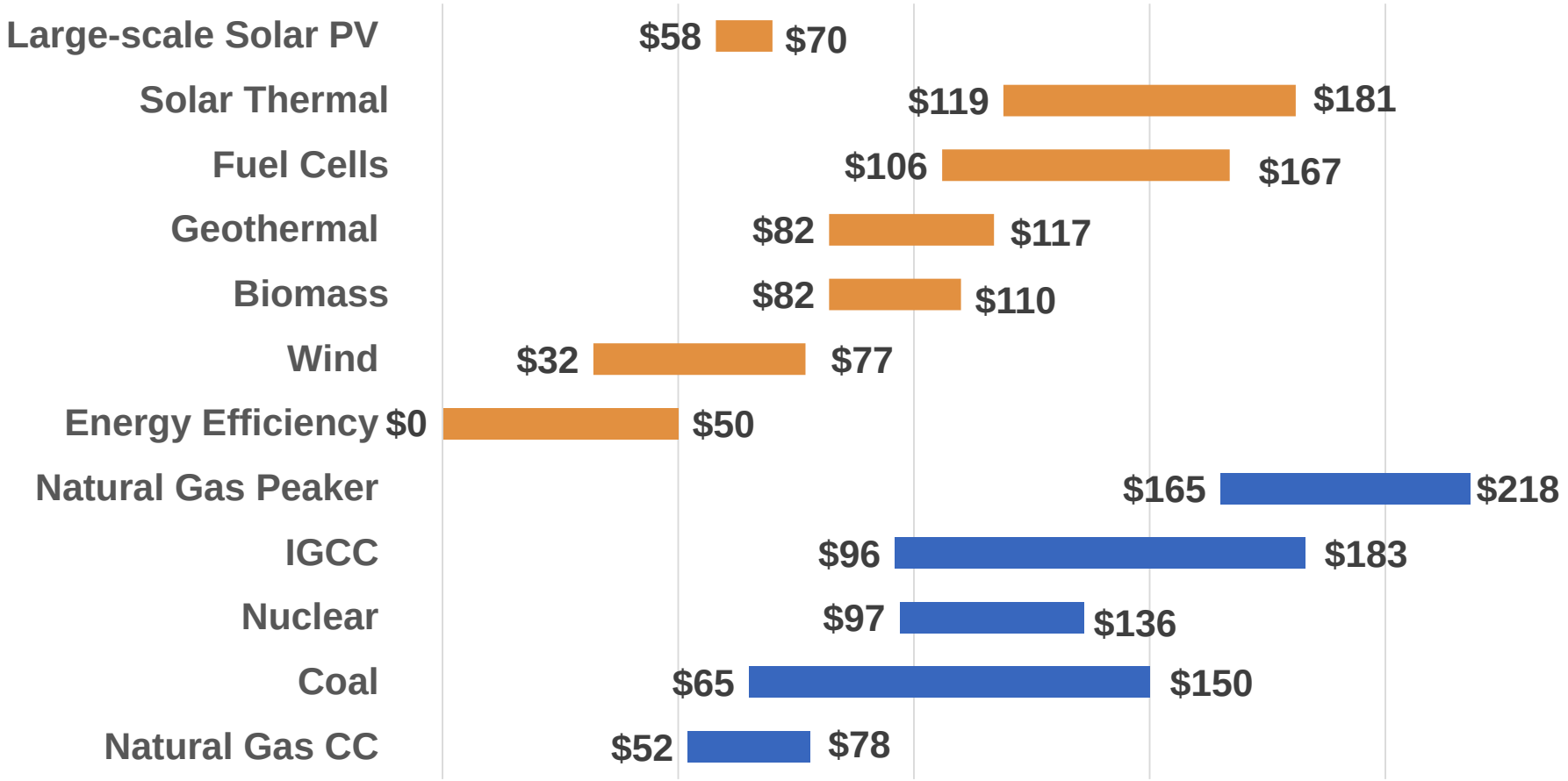
State Tool for Electricity Emissions Reduction

State Tool for Electricity Emission Reductions (STEER) model

Modeling a Low-Cost Approach to Clean Power Plan Compliance for Virginia

Moreover, these technologies are cost competitive with traditional sources

Unsubsidized, Levelized Cost of Electricity, 2015 ($/MWh)



Source: Lazard

Advanced energy can provide economic and environmental benefits if planned properly

Other Options

Carbon capture and sequestration

Demand response*

Other grid-connected renewables (offshore wind, DG, biomass, wave and tidal power)

Energy storage**

Zero-emitting fuel cells

End-use energy efficiency ESCOs, behavioral programs, appliance replacement, building energy codes, appliance codes

CHP, WHP, and cogeneration

New and incremental nuclear

T&D efficiency (VVO, CVR, smart grid)

BSER

Renewables (onshore wind, utility-scale solar PV and CSP, geothermal, hydro)

Coal-to-existing NGCC switching

Heat rate improvements

*Eligible to the extent it reduces net MWh end-use.
**Cannot receive explicit credit but its benefits can be recognized in plans.

A lack of holistic planning often results in inefficient decisions

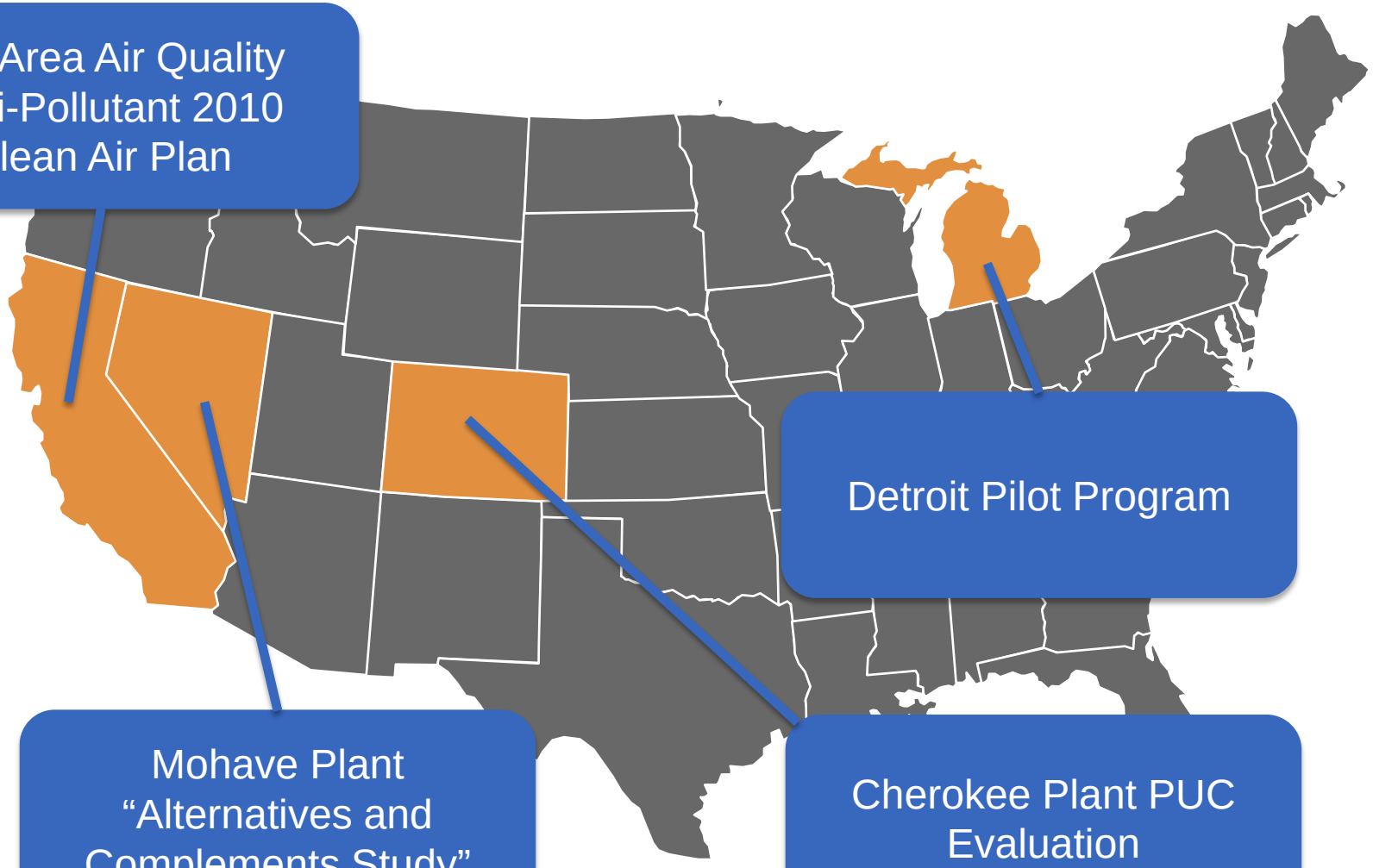
- Wyoming may spend billions on pollution upgrades, yet plants may retire soon anyway due to de-carbonization

Unfortunately, a series of structural issues limit integrated energy + air planning

Structural Issues

- CAA addresses one pollutant at a time
- No one owns holistic planning
  - Air regulators focused on pollution
  - PUCs focused on cost/reliability
- Regs often challenge use of advanced energy and other integrated solutions

But there are other limited examples of success



The Commonwealth can move its policies to capture more of the opportunity

In 2015

- **Wind Power alone**
  - Reduced CO_2 emissions by 132 MMT
  - Reduced NO_x emissions by 106,000 MT
  - Reduced SO_x emissions by 176,000 MT
- **Energy Efficiency**
  - Reduced CO_2 emissions by 490 MMT

So the next step is ‘no regrets’ analysis and planning

Planning Benefits

- Planning needs to happen no matter what happens in pending litigation
- Puts state in driver’s seat when it comes to implementation rather than the feds
- Allows states to optimize their approach for meeting a variety of needs in the state

Questions

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