The Most Important Fiscal and Economic Issues Facing New York State
Principles and Strategies for an Affordable and Effective State Energy Plan

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CITIZENS BUDGET COMMISSION
Presentation Overview

• New York: Energy Basics

• New York State Energy Plan Goals

• Principles for Assessing Options for Achieving Energy Goals

• Recommendations
Sources and Uses of Power in NYS

Sources, 2015

- Natural Gas, 37.5%
- Petroleum-Based, 33.2%
- Nuclear, 12.5%
- Renewables, 7.5%
- Bioenergy, 3.1%
- Coal, 1.1%
- Net Imported Electricity, 5.2%

Uses, 2015

- Transportation, 39.3%
- Commercial, 23.9%
- Residential, 29.4%
- Industrial, 7.4%
# Shift to Cleaner Sources of Electricity

## Electric Sector GHG Emissions Down 42%

<table>
<thead>
<tr>
<th></th>
<th></th>
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</tr>
</thead>
<tbody>
<tr>
<td>Coal</td>
<td>1.2</td>
<td>19%</td>
<td>2%</td>
<td>39%</td>
<td>9%</td>
</tr>
<tr>
<td>Petroleum</td>
<td>.83</td>
<td>25%</td>
<td>1%</td>
<td>41%</td>
<td>5%</td>
</tr>
<tr>
<td>Natural Gas</td>
<td>.47</td>
<td>17%</td>
<td>41%</td>
<td>19%</td>
<td>82%</td>
</tr>
<tr>
<td>Nuclear</td>
<td>-</td>
<td>17%</td>
<td>32%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Wind &amp; Hydro</td>
<td>-</td>
<td>21%</td>
<td>22%</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Other</td>
<td>1%</td>
<td>2%</td>
<td>2%</td>
<td>2%</td>
<td>5%</td>
</tr>
</tbody>
</table>

Note: May not add to 100% due to rounding.

Green and Getting Greener

8.4% Reduction in GHG Emissions, 1990 and 2015
(Millions of Metric Tons of CO2 equivalent)

Rank in State CO2 Emissions Per Capita, 2015

- Transportation
- Residential
- Commercial
- Industrial
- Other
- Electricity Gen
NY Among 5 Large States With Declines

Increased or Steady Emissions in 5 Other Large States

Regional Greenhouse Gas Initiative (RGGI)

An effective 9-state cap-and-trade system

40%

Electric power sector emissions decrease in RGGI states between 2005 and 2015
High Electrical Rates
Hourly Rates Per KWh, 2015

Source: US Energy Information Agency
Objective: Clean, resilient and affordable energy system

Primarily concerned with greenhouse gas (GHG) reductions as indicated by defined targets:

- 40% reduction of GHGs from 1990 levels by 2030 (80% by 2050)
- 50% of electric energy produced by renewables by 2030
- 600 trillion Btu increase in statewide energy efficiency
### Heavy Lift to Meet Renewable Target

<table>
<thead>
<tr>
<th>Proposed Projects</th>
<th>Capacity (in megawatts)</th>
<th>Capacity Factor</th>
<th>Projected Energy (In Gigawatt Hours)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upstate Wind</td>
<td>4,264</td>
<td>27%</td>
<td>10,100</td>
</tr>
<tr>
<td>Offshore Wind RFP</td>
<td>2,400</td>
<td>45%</td>
<td>9,500</td>
</tr>
<tr>
<td>Deepwater Wind</td>
<td>90</td>
<td>45%</td>
<td>350</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>19,950</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Shortfall Against 29,200 GHW Goal</strong></td>
<td><strong>(9,250)</strong></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Even more may be required if decarbonization of transportation and residential and commercial heating sectors occurs to meet goals.

*Note: Capacity Factor is a measure of full power productivity across all hours of the year.*
## Costly Proposals

**Preferred Approach: Additional OffShore Wind**

<table>
<thead>
<tr>
<th>Proposed Projects</th>
<th>Capacity (in megawatts)</th>
<th>Capital Cost (per KWh)</th>
<th>Cost (in billions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Upstate Wind</td>
<td>4,264</td>
<td>$1,800</td>
<td>$7.7</td>
</tr>
<tr>
<td>Offshore Wind RFP</td>
<td>2,400</td>
<td>$5,000</td>
<td>$12.0</td>
</tr>
<tr>
<td>Deepwater Wind</td>
<td>90</td>
<td>$5,000</td>
<td>$0.5</td>
</tr>
<tr>
<td>Additional Offshore Wind</td>
<td></td>
<td>$5,000</td>
<td>$11.5</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td></td>
<td><strong>$31.7</strong></td>
</tr>
</tbody>
</table>

**Potential Hit to Rate Payers:** 10%

Source: Estimated capital costs from US Department of Energy, National Renewable Energy Laboratory.
Principles for GHG Reduction Approaches

- Prioritize the most **cost-effective** options in terms of incremental carbon reduction per dollar spent
- Utilize **market incentives** to influence behavior where possible
- **Partner** with other states and Canada to promote market solutions
- Preserve **long-term flexibility** by maintaining optionality
  - Use a portfolio approach to meeting the goals
  - Be technology and fuel neutral
Policy Recommendations

1. Establish an economy-wide pricing system covering all sectors
2. Retain the use of nuclear energy
3. Look for low-cost, low-emission energy suppliers across state borders
4. Avoid self-imposed constraints such as limiting gas pipeline capacity
5. Promote transportation solutions that build on existing infrastructure
6. Pursue renewables that are cost-justified
Economy-Wide Carbon Pricing

Build on the RGGI Model

- Expand existing cap-and-trade system to encompass all sectors
  - RGGI currently covers only power sector, which accounted for 17% of NY MMTCo2e emissions in 2015

- Adopt a carbon tax on all sources of fuel
  - Sends a common price signal and leads to an efficient deployment of resources
  - Politically challenging, but clearer, fairer, and easier to implement and administer
  - Should include clear mechanisms to return funds to taxpayers
Retain GHG Benefits of Nuclear Energy

Impact of Nuclear Plant Closings

- Indian Point plants shutting down in 2020 and 2021; three more plants shutting down by 2034
- Zero Emission Credits (ZECs) expire in 2029
- In the short-term, will be replaced by natural gas
- Will erase nearly all reductions achieved in electrical power sector from 1990-2015
Look Beyond NY’s Borders

O Canada….

- Currently, import 7,000 GWH annually from Canada

- Hydro Quebec, Canadian Utility, has proposed new transmission lines to NY to supplement this, but have been denied

- Public Service Commission (PSC) does not currently recognize new hydropower facilities as eligible for renewable energy credits

- Hydro lifecycle GHG emissions are on par with wind and solar; PSC should reconsider its ruling
Avoid Self-Imposed Constraints

- Pursuit of GHG emission reductions should not preclude short-term reliance on natural gas
- Restraints on natural gas supply absent alternative energy sources have counterproductive side effects
  - Limits new natural gas customers and conversions from higher emitting fossil fuels
Tackle Transportation

- Subsidizing electric personal vehicles is an expensive GHG reduction strategy
- More effective to reduce vehicle miles traveled and bolster public transportation options:
  - Stem ridership losses on New York City Transit (NYCT)
  - Expand public transportation to underserved areas
  - Reduce congestion through pricing, especially of single-occupancy vehicles
Pursue Cost-Justified Renewables

- Renewables are and should continue to be part of the state’s energy portfolio; but price signals should determine how much wind capacity
- Long-term contracts limit benefit from technological innovations
- Overreliance on one technology could lead to unnecessary cost increases
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