Moving States Towards Multi-Pollutant Air Quality Planning

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Take-Away Message

- An integrated multi-pollutant planning approach, supported by a technical framework, can enable states to:
  - meet air quality objectives
  - reduce greenhouse gases
  - meet electricity demand through reliable and diverse supplies

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Traditional Air Planning Approach is Becoming Less Effective

- Climate Change has moved to center stage on the policy agenda
- Single pollutant programs can't solve all air quality problems, and can create or exacerbate other problems
- States have many competing needs, e.g., economic, environmental, energy, security

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Multi-Pollutant Planning Makes Sense

- Energy and air quality are linked -- programs that reduce greenhouse gases can also reduce PM and ozone precursors
- Can be a more cost-effective approach, using state resources effectively and efficiently
- Can identify potential tradeoffs and provide information for policy makers to make informed decisions
- Can result in equal and better environmental results overall

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NESCAUM's View of Multi-Pollutant Planning

- Addresses multiple pollutants, including SO_2, NO_X, CO_2, PM, and Hg
- Highlights tradeoffs and co-benefits
- Analyzes the economic and environmental implications of various planning options
- Allows for multi-sector analyses

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Need to Change Planning Paradigm

- Move to a broader, longer term multi-pollutant planning approach, from which the SIP can be developed
- SIP is no longer the sole driver, but one of several drivers and components
- Work with/align various state offices in a new planning exercise to identify common solutions

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Need to Modify Planning Horizons

- Air quality agenda requires multiple plans and regulations on relatively short-term planning cycles (typically three to nine years)
- Energy and Climate programs work under longer term planning cycles
- Possible to plan for longer cycles while meeting shorter term goals

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NESCAUM's Goals

- Enable state multi-pollutant planning through replicable, consistent and predictable protocols
- Foster integrated environmental and energy planning by leading with energy
- Refine tools that can support integrated, multi-pollutant work, and can be applied on a national scale
- Ensure that results from this approach can be used in SIPs and by energy planners to develop their Integrated Resource Plans (IRPs)

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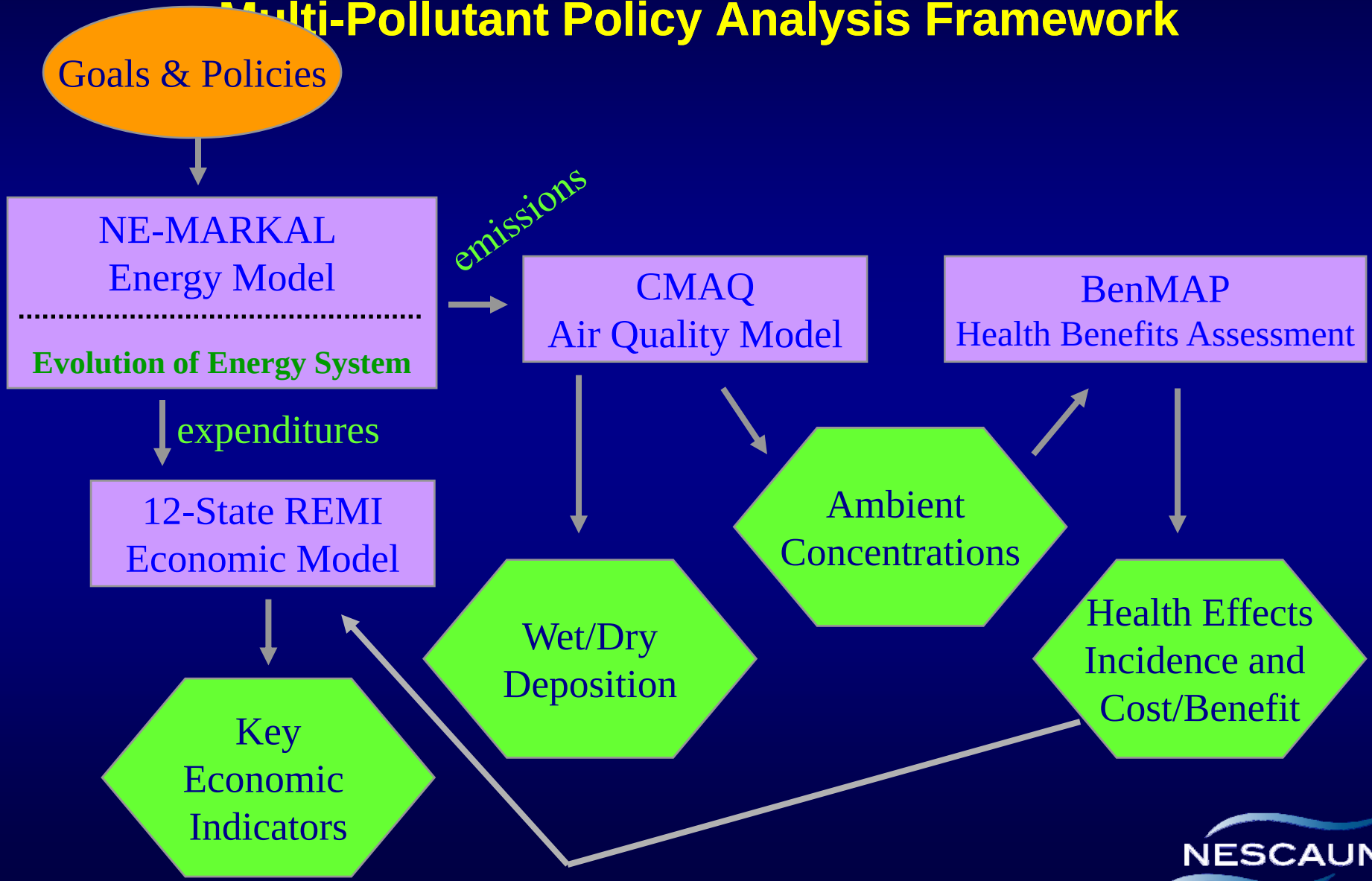
NESCAUM's Multi-Pollutant Policy Analysis Framework (MPAF)

NESCAUM's Multi-Pollutant Policy Analysis Framework



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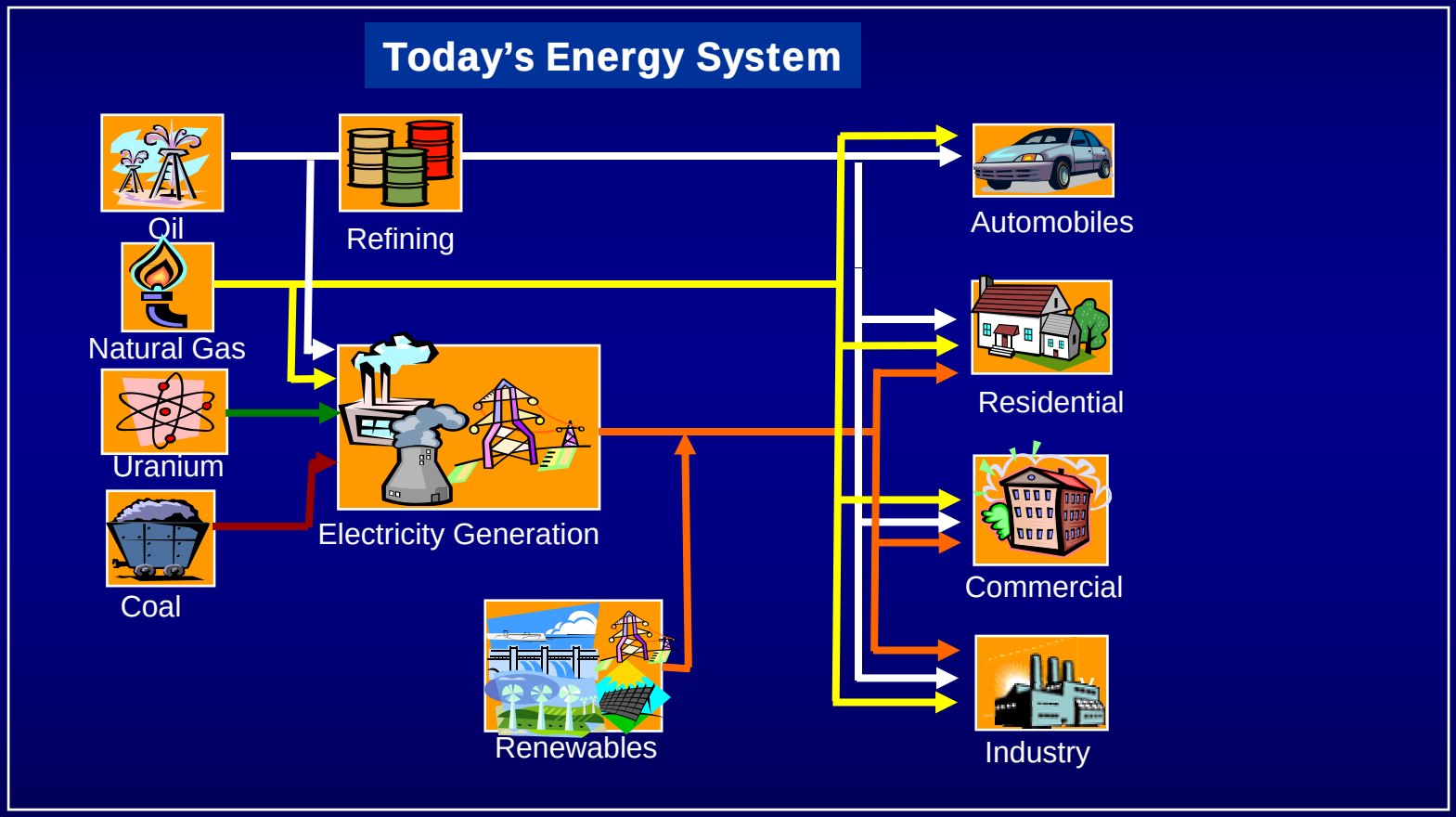
NE-MARKAL:
Energy Model as Centerpiece



Source: EPA ORD

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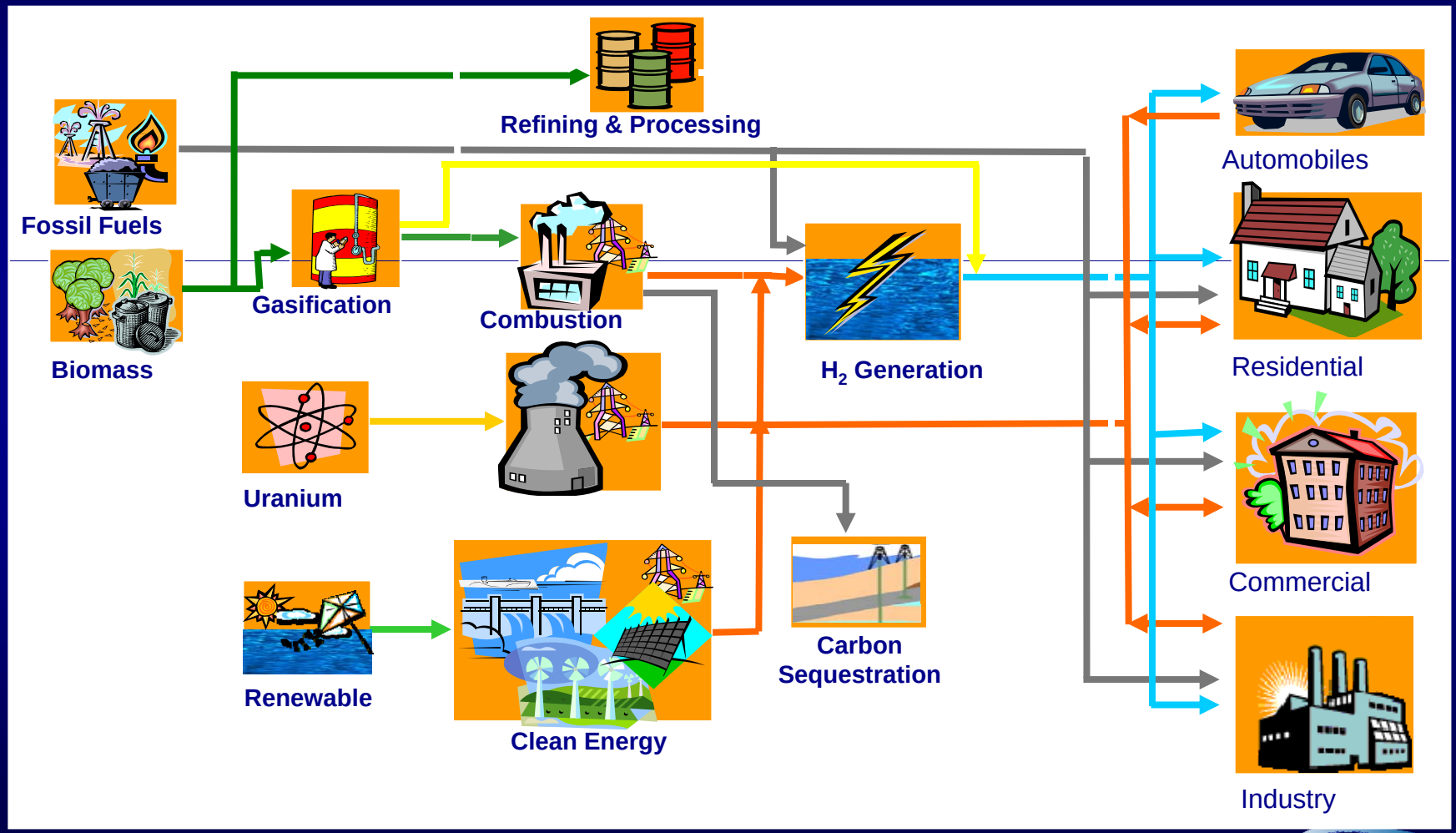

Source: EPA ORD

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Example of Results

Transportation Example

- Fuel and Technology Deployment
- Emissions
- Costs

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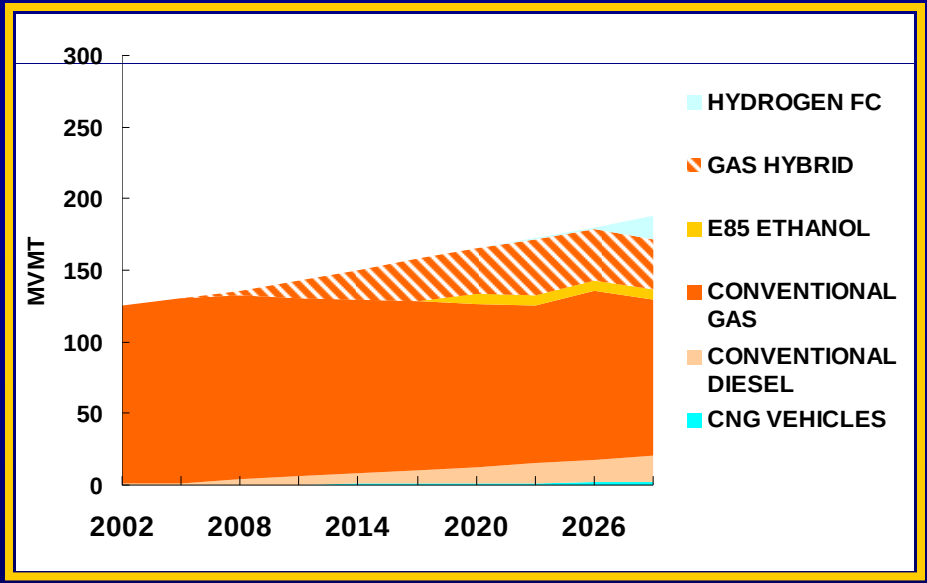
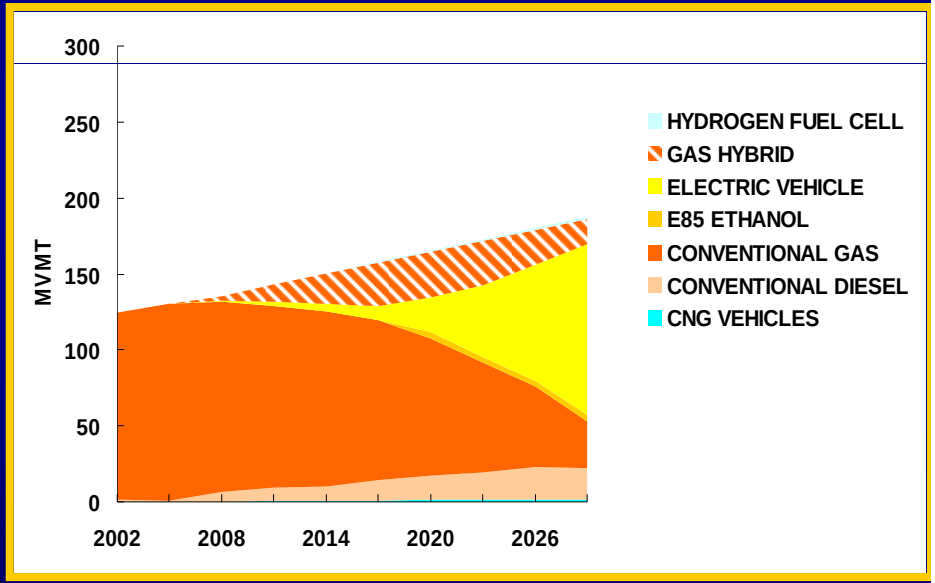
Example Transportation Policy (state-specific projections)

Technology Deployment Changes with EV Mandate

Reference



With Policy



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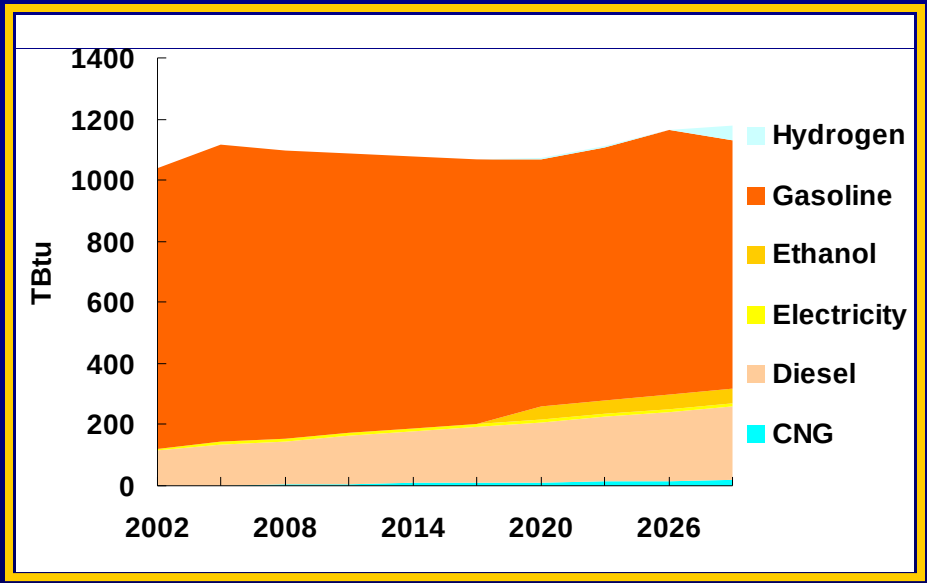
Example Transportation Policy (state-specific projections)

Fuel Consumption Changes with EV Mandate

Reference



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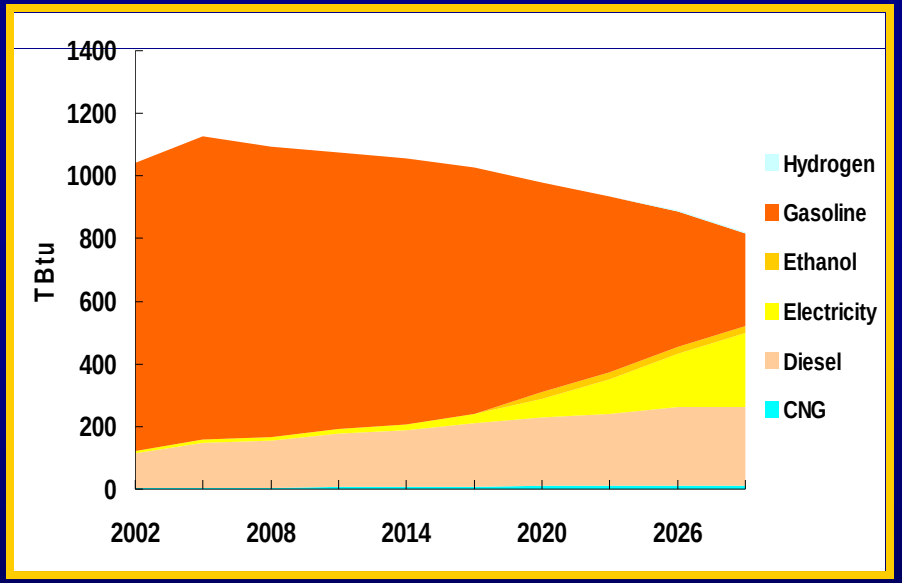

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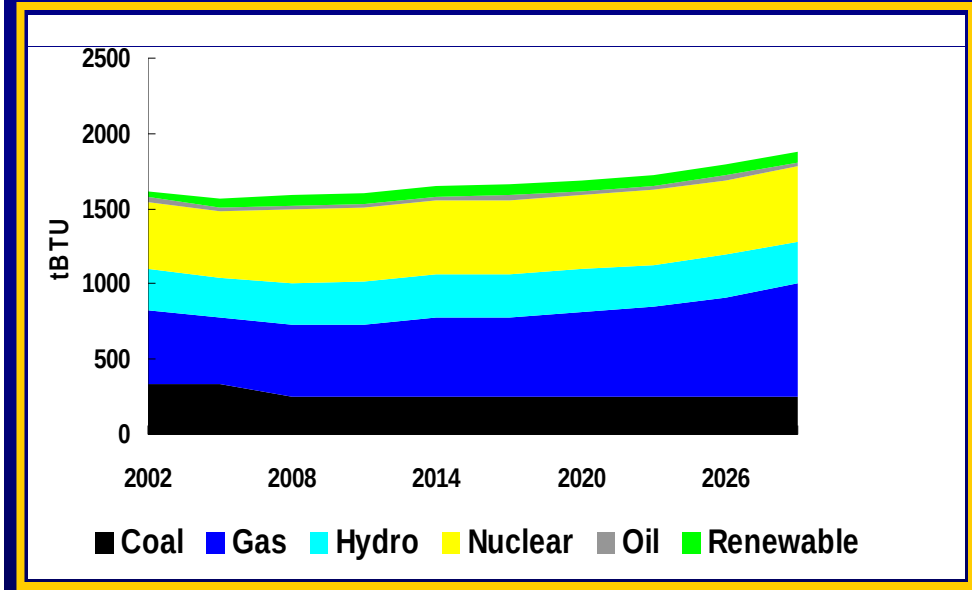
Example Transportation Policy (state-specific projections)

Power Generation Changes with EV Mandate

Reference



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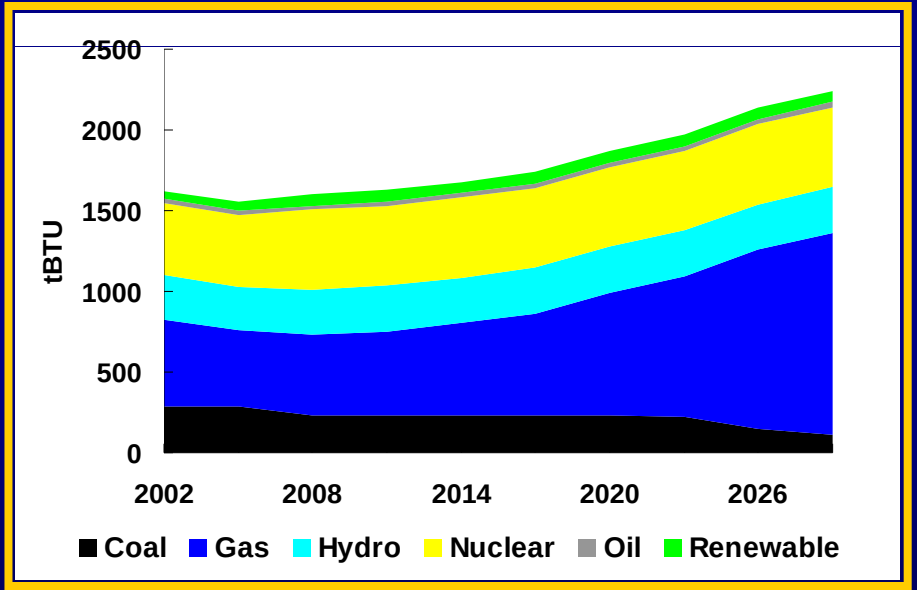

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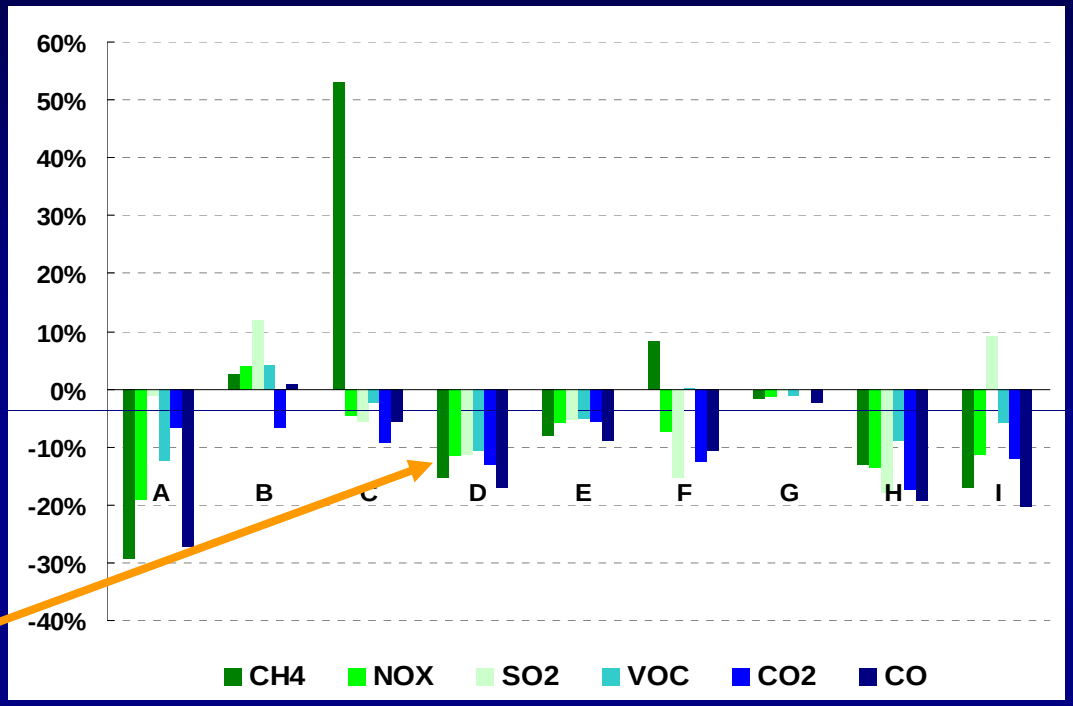
GHG & Criteria Pollutant Emission Reductions (state-specific projections)



EV Policy

- Climate focused policies can help to meet short- and long-term criteria pollutant goals.
- Near-term criteria pollutant goals, however, play only a small role in achieving long term climate goals.
- The multi-pollutant approach provides the opportunity to simultaneously address criteria and climate pollutant goals more efficiently than a pollutant by pollutant approach.

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Change in Total System Cost (analysis done for one state)

	NPV Cost Change Relative to Reference	Run Type
A	-1.2%	Constraint
B	-0.3%	Constraint
C	0.2%	Constraint
D	1.4%	Constraint
E	-4.3%	Demand Reduction
F	-0.5%	Constraint
G	-0.1%	Constraint
H	1.2%	Constraint
I	-1.4%	Constraint

EV Policy →

- The multi-pollutant approach also allows decision makers to weigh cost against environmental benefits for multiple scenarios, multiple pollutants, multiple sectors

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Air Quality, Public Health, and Economic Analyses

- Emissions projections are inputs for air quality models
- Traditional estimates of monetized mortality/morbidity impacts are calculated from projected air quality changes
- Monetized health impacts can be fed back into regional economic model to estimate scenario-specific projected economic impacts on Gross State Product, labor income, and jobs

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Advantages to Using NE-MARKAL

- Quick to run and turn around results
- Relatively inexpensive to use
- Transparent to review
- Detailed enough to assess a wide range of climate, air quality and energy policies
- Can analyze at different levels (state/regional), as well as multiple and/or single strategies
- Outputs can link to other models – REMI, CMAQ, BenMAP
- Is a multi-pollutant model. Outputs include: emissions changes in CO2, NOx, PM; Hg for power sector, and; SO2, VOC, CO for transportation sector
- Shows trade-offs
- Is an energy model – its use by air regulators starts the integration between air and energy

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Limitations to Using NE-MARKAL

- While expansive in its coverage, it will not provide perfect representation of all sectors and technologies
- Should be used for comparative policy analysis, not energy dispatch or forecasting
- Does not simulate behavior or consumer response

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How This is Different

- Broader planning horizons, bigger picture, multi-disciplinary
- The planning happens first, results then feed into various plans (i.e., SIP, IRP)
- An iterative process – the model must first be tailored to state-specific conditions before it can be used to inform decisions
- Requires policy-makers to look at tradeoffs
- NE-MARKAL outputs can be used as inputs to other models; results are useful to state policy makers
- Outputs can inform air, energy, and economic policy (and vice versa)

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The Time is Ripe for Multi-Pollutant Planning

- Has the potential to align various state offices in a new planning exercise and identify common solutions.
- Can enable states to meet air quality objectives, reduce greenhouse gases, and meet electricity demand through reliable and diverse supplies
- Can identify potential tradeoffs and provides information for policy makers to make informed decisions.
- Tools are out there and available. NESCAUM's framework leads with energy and can help air regulators move toward multi-pollutant planning.

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THANK YOU!

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