Considerations for Decarbonization of Industry

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July 2019
What is Carbon Neutrality?

Sources = Sinks

Carbon Neutral is a goal in which in state GHG emissions are minimized through the use of low GHG, zero GHG, and negative GHG technologies and achieving an equivalent amount of reductions from state, national, and international emission reductions projects.

Economics will help determine the balance between sinks, mitigations, and offsets.
Protecting Competitiveness of California's Industrial Sector

INTERNATIONAL POLICY

NATIONAL POLICY

REGIONAL POLICY

STATE POLICY
Predictions for a Future Generation

- Prepare and Account for business cycles in order to avoid the predictable politics that accompany contraction/recession and capitalize on the economic benefits from recovery and expansion cycles.

- Cannot precisely predict economics or technology – allow maximum flexibility based on evolving economics.
Everything And...

• All solutions for all sectors
  • Transition segments where a business case can be made
  • Renewable and carbon neutral fuels or carbon negative fuels
  • Carbon Capture and Sequestration/Use

• Maintain and protect high quality industrial jobs
  • Support a robust middle class through advanced energy and manufacturing

• Increase opportunities in biological and industrial sequestration as a field of work
Prescription – getting in the way of good...

- Restriction and bans on current and future technologies
  - Restrictions on emission reduction project types and locations

- Picking winners and losers through regulation or law

- Displacement of Manufacturing from urban core – potentially entire state
  - Reliance on professional and service-based two track economy
  - Increased cost of living in cities
  - Loss of unionized manufacturing
Transforming Manufacturing

Will California pick winners and losers?

Electrification
- Costs for industrial ratepayers
- Energy Efficiency vs. Zero On-Site Emissions
- Infrastructure Needs

Carbon Neutral and Carbon Negative Fuels for Thermal Processes

Carbon Capture and Sequestration or Use
- Standards and Policy
- Carbon Emissions to Value Added Product
  - Polymers
  - Cement
  - Syngas
Conclusion – A Moonshot

• California’s biggest contribution will be sound public policy that leads other jurisdictions to join our path

• Carbon Neutrality will transform every aspect of our economy
  • We still need to find the best questions that need answers...

• Consider reducing near and midterm prescription if the emission reductions are real and advance us towards the mid-century goal

"We set sail on this new sea because there is new knowledge to be gained, and new rights to be won, and they must be won and used for the progress of all people."

President John F. Kennedy