1-18-2012

SLIDES: Natural Gas: Game Changer or Runner Left on Base? Working to Get It Right in CO!

Gary Graham

Natural Gas:

Game Changer Or Runner Left on Base?

Working to Get it Right in CO!

Dr. Gary Graham

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WESTERN RESOURCE ADVOCATES

Opportunity:
A Clean Energy Future

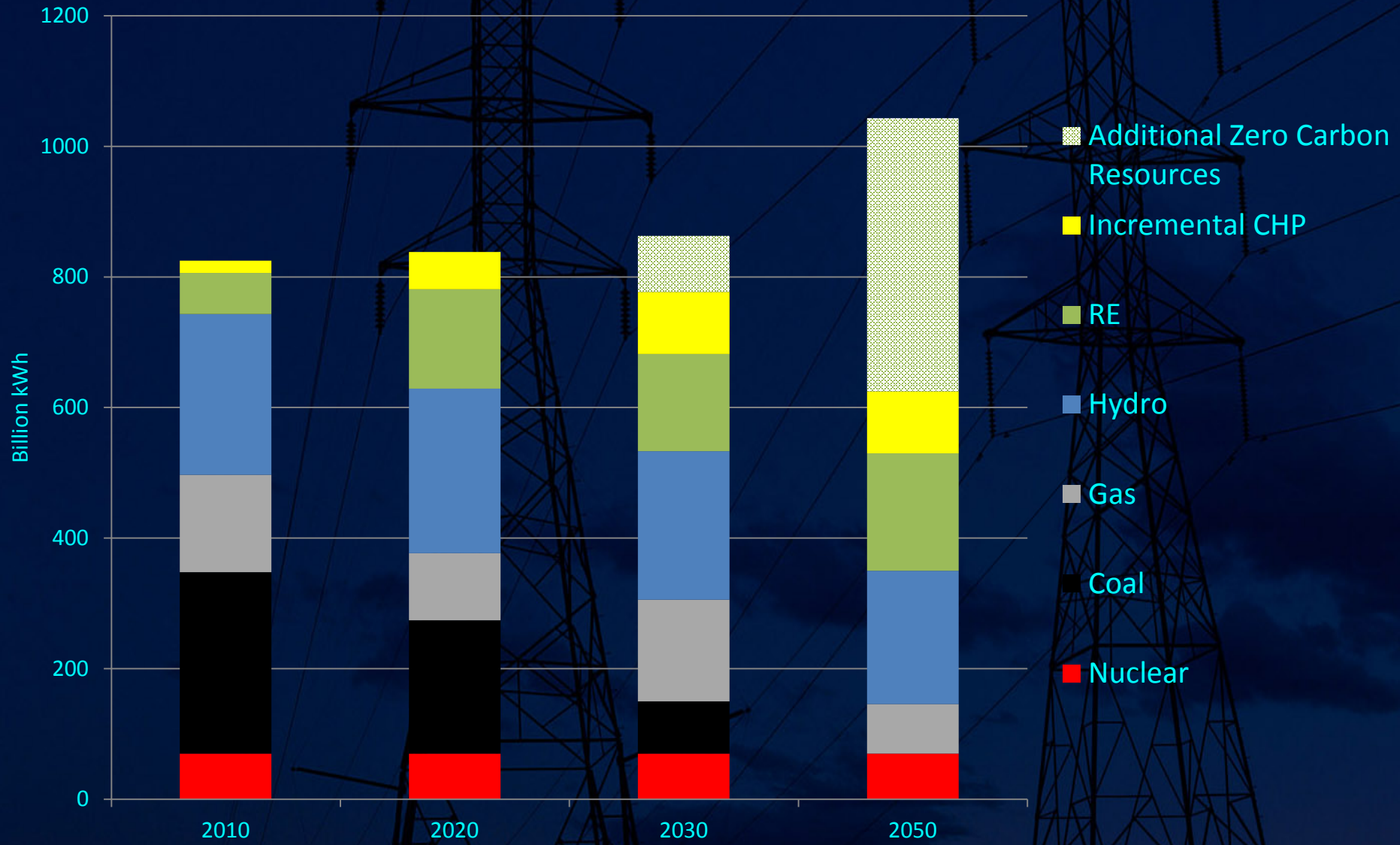
Benefits:

- Public Health: prevent illnesses, reduce medical costs
- Environmental: climate, biodiversity, water, ecosystems
- Economic: create domestic jobs, increase global competitiveness
- National Security: more reliable supplies

Clean Energy Vision

- An electric sector in the West that meets its share of IPCC target: 80% reduction below 1990 levels by 2050
- Need about 100,000 MW new RE with aggressive EE, DR, and DG
- Natural gas will occupy an important role in our transition to a clean energy future
- **www.cleanenergyvision.org**

CEV Generation Portfolio

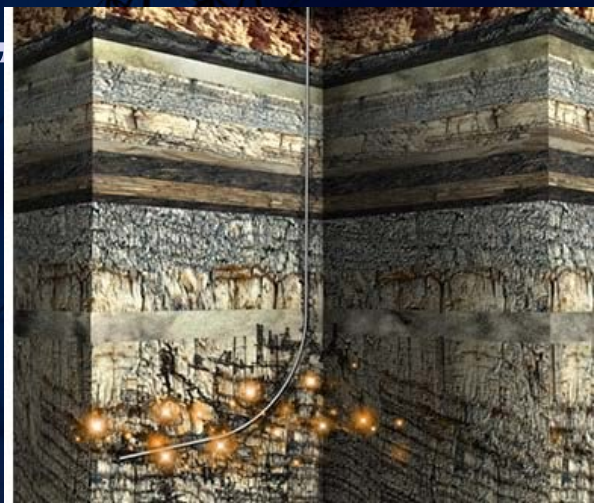


Use of NG Could Increase

- With technological advances that increase efficiency
- With additional carbon control and storage technologies
- The interplay between the electricity and transportation

WRA's Perspective

Ensure that natural gas plays an appropriate role in transitioning the western electricity sector to a lower carbon electricity mix, while also ensuring that natural gas extraction, production, and transportation are done in a way that safeguards our climate, people and the region's land, wildlife, air and water.



Need for System Flexibility

Character of generation and loads is changing

- More Variable Energy Resources (VERs) being added
- Aging coal fleet being retired
- Flexible gas resources complementing VERs, and together replacing carbon intensive coal resources
- More electronic loads being added

Game Changer Challenges

- **Use of natural gas for electricity**
  - **Transition fuel**
- **Extraction practices**
  - **Geography, ecology, safety and BMPs important**
  - **Efficiency, public perceptions, and community relations are important**

Challenges: Transition Fuel

- Transition to 2050
- Generate electricity from gas for capacity and flexibility, not as one-to-one base load fuel replacement
  - Gas alone does not get us there – 50 % less carbon is still too much
  - Underutilized gas generation now
  - Initial design and equipment choices important

Challenges: Transition Fuel

- NG complements more variable generation and does not displace RE or EE
  - Together NG, RE and EE replace aging coal generation
- Locate new plants close to load
  - Minimize cost and transmission
  - Pipeline safety, fugitive emissions
- Improve efficiency of gas plants
  - More cogeneration

Geography and Ecology Challenges

- Protect wildlife habitat and wild places by foregoing some leases and carefully siting infrastructure on existing leases.
  - Avoid direct, indirect, and cumulative impacts (science is critical)
  - Minimize impacts through stakeholder and scientifically supported mandatory BMPs
  - Mitigate consistent with stakeholder requirements (no net loss)

Geography and Ecology Challenges: Water

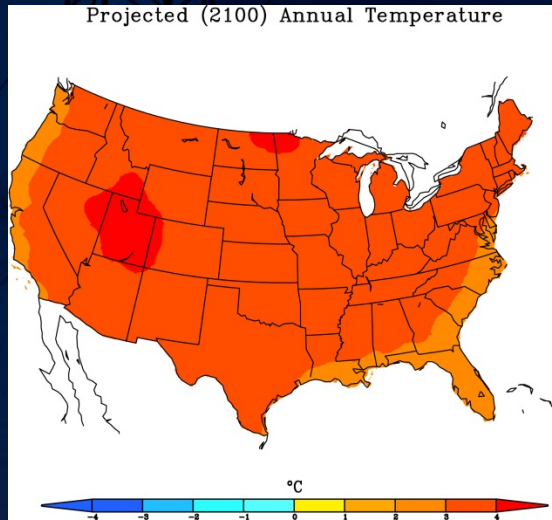
- Use water efficiently
  - Minimize quantity, maximize quality
- Report transparently water needs, acquisition and disposal
- Avoid contamination of ground and surface water
  - Adopt standards for minimum and maximum casing and cementing for wellbores
  - Ensure standards are protective

Geography and Ecology Challenges: Water

- Implement and conduct mandatory baseline water testing, monitoring and tracing
  - Determine causation when fracking is a suspect in water contamination
- Adopt more pitless development
- Adopt standards for pit construction, maintenance, and inspection
  - Ensure effective protection

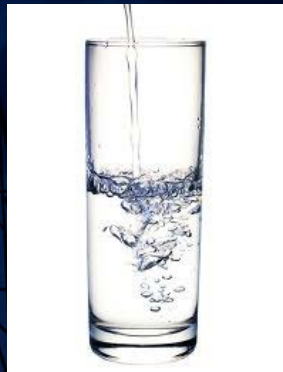
Geography and Ecology Challenges

- **Monitor and minimize climate impacts**
  - Measure and report GHG emissions from all stages of oil and gas development
  - Support GHG performance standards for plants
  - Use infrared detection technology and pipeline maintenance programs to prevent fugitive emissions
  - Minimize flaring



Solutions to Safety Challenges

- Increase residential setbacks because longer distances from drilling rigs to homes can be the best protection for residents and their water wells
- Make landowners whole with when operations impact their operations, water and/or health
- Support local control regarding appropriate drilling proximity to homes and communities



Solutions to Safety Challenges

- **Require full public disclosure** of all fracking constituents
  - Colorado now a model for other states

- **Help fund and conduct health impact studies** to adequately address public health risks

Benefits for Oil and Gas Industry

- **Putting causation issues to rest**: If scientific testing, monitoring and tracers determine causation, industry can't be blamed for pollution where the evidence doesn't indicate oil and gas is the cause

- **Financial:** Industry can improve its bottom line by capturing fugitive methane emissions and keeping gas *in* the pipeline thus reducing climate impacts

- **Improved relationships:** Landowners respect industry for being good neighbors and making good on their bargain to make things right if something goes wrong

Benefits for Oil and Gas Industry

- **Improved partnerships**. Conservationists can recognize that natural gas has a legitimate role as firming power as we accelerate the transition to a cleaner grid

- **Pre-drilling analysis.** Conservationists can agree that streamlined review is appropriate for drilling permits tiered to comprehensive development plans. Once such plans are approved, industry has regulatory certainty on its ability to implement its drilling plan

Next Steps

- All be open to suggestions and discussion:
  - we don't pretend to have all the answers
- Acknowledge the challenges and need for communication and collaboration
  - Industry has a major role in contributing its technical expertise to developing workable solutions
- Increase use of existing gas fleet
- Enable most efficient gas to retire least efficient coal
- Procure gas to supply electrical generation capacity and flexibility

Next Steps

- Develop plan with state agencies (including CDNR, COGCC & CDPHE), NGOs, and State Universities to develop solutions, BMPs and policy responses to priority issues

- Coordinate with BLM, EPA and other appropriate federal partners
  - DOE shale gas advisory committee: 20 specific recommendations, large & small


Our collective energy future is critically important and very complex. We have to “get it right” working together with honest straightforward dialogue
Let’s “get er done”