

## “Smart Grid” technologies and systems (à la the NYT)



1. SOLAR PANELS AND WINDMILLS
2. "SMART APPLIANCES"
3. REMOTE CONTROL DEVICES
4. PLUG-IN HYBRID CARS
5. LOCALLY-GENERATE POWER AND SUPERCONDUCTING POWER LINES.
6. WIRELESS CHIPS
7. WEB AND MOBILE-PHONE INTERFACES
8. ENERGY STORAGE

## The national interest advocate's goals for transmission: Building a national highway for national needs

- **Various principles for “the national interest” in transmission:**
  - **Top down focus on national transmission needs**
    - Interconnection-wide planning
    - Facilitated (if not conducted) by federal entities – directly or indirectly
  - **Federal authority over:**
    - Siting of all high voltage lines (more than today's backstop authority)
    - Siting of transmission to support development of domestic energy resources (e.g., renewables, coal)
  - **Socialization of costs for “national need” transmission**
    - Established by FERC if supported through transmission tariffs (rolled into wide-area rate)
    - Established by Congress if supported through tax

## President Obama: interested in the electric grid



**“We will build ... electric grids  
...We will harness the sun and  
the winds....”**  
– Inaugural Address



**“We will soon lay down thousands  
of miles of power lines that can  
carry new energy to cities and  
towns across this country.”**  
– Joint Session of Congress, 2009

## Renewables and transmission – a major push from DC



"One of ... the most important infrastructure projects that we need is a whole new electricity grid. Because if we're going to be serious about renewable energy, I want to be able to get wind power from North Dakota to population centers like Chicago."

– Barack Obama



"We cannot let 231 state [utility] regulators hold up progress." He argued that states should be given every opportunity to participate, but "there may come a time when the federal government will have to step in."

– Harry Reid

[Hebert, Josef, "Placement of Power Grid is Debated", *Boston Globe*, 2/24/09, p. A9]



"Chairman Waxman and Rep. Inslee clearly appreciate the critical role transmission plays in facilitating the achievement of the energy policy goals and objectives of the legislation, including the development of renewable, emissions free resources. Unfortunately, they were unable in the limited time available to craft the needed provisions to be included in the bill."

– Joseph L. Welch, ITC

<http://sev.pnews.wire.com/hull/20090626/NY3898826062009-1.html>



U. S. DOE –  
Financial Assistance Funding Opportunity Announcement  
Recovery Act-Resource Assessment and Interconnection-Level  
Transmission Analysis & Planning, 2009

## The states' rights advocate's goals for transmission: Keeping local regulatory control

- **Various principles for states' rights & local control re: transmission:**
  - **Traditional view: role of transmission as part of utility regulation**
  - **Siting of transmission is essentially a state prerogative**
  - **Transmission system planning and expansion:**
    - First focus is on meeting the needs of local loads within the utility's footprint – optimization of generation and transmission
    - Problem solving: focus on adding the minimum required to satisfy the need
  - **The state may have economic development goals (e.g., renewables) – but wants users of energy to pay for transmission**
  - **More generally, transmission for others:**
    - Not if it raises local rates; only if paid for by others
    - Only if it also provides some benefit locally

# NARUC Resolution (3-2009) Resolution Re: Possible Federal Legislation Amending the FPA Addressing Expansion of Transmission Facilities

## Resolution Regarding Possible Federal Legislation Amending the Federal Power Act Addressing Expansion of Transmission Facilities

WHEREAS, the siting of electric transmission facilities has historically been subject to the exclusive jurisdiction of the States; and

WHEREAS, it is in the States' interests to ensure that adequate electric transmission facilities are constructed to meet the needs for economic and reliable utility service; and

WHEREAS, it continues to be the long-standing position of the National Association of Regulatory Utility Commissioners (NARUC) that Congress should not expand Federal authority over transmission siting either through amendments to the Federal Power Act or through other Federal legislation; and

WHEREAS, Section 216 to the Federal Power Act, enacted as part of the Energy Policy Act of 2005, provides the Federal Energy Regulatory Commission (FERC) with limited "backstop" transmission siting authority; and

WHEREAS, it is anticipated that within the next few months, Congress will be considering an Energy Policy Act that will provide FERC with expanded authority over the siting and construction of new interstate transmission lines, the

RESOLVED, that in connection with any proposed legislation that would amend the Federal Power Act to expand FERC's current authority over the siting and construction of new interstate transmission lines, the Commission recommends that Congress incorporate the following principles into such legislation:

- That any such additional authority granted to FERC by the legislation allow for primary siting authority to be exercised only in those cases where FERC's "backstop" siting authority be as limited in scope as possible;
- That, in no event should FERC be granted any additional authority over the siting or construction of new interstate transmission lines;
- That, in no event should FERC be granted any additional authority to approve or to issue permits for the siting or construction of a new interstate transmission line that is not consistent with a regional or other designated State siting authority;
- That, in no event should FERC be granted any additional authority to approve or to issue permits for the siting or construction of a new interstate transmission line unless there is already in place either (1) a cost-allocation agreement for the proposed project that governs how the project will be financed and paid for; or (2) a cost-allocation methodology that covers the entire route of the proposed project;
- That, in no event should any such legislation allow FERC to preempt State authority over the siting or construction of new interstate transmission lines, or to preempt State authority over environmental impacts under State authority, the interconnection to distribution facilities, or the siting or construction of new intrastate transmission lines by affected stakeholders in state and/or regional planning processes; and
- That, in no event should any such legislation preempt existing State authority to regulate the siting or construction of new intrastate transmission lines.

Sponsored by the Committee on Electricity, Adopted by the NARUC Executive Committee

“...Congress should not expand federal authority over transmission siting....”

..any new federal law should “...allow for primary siting jurisdiction by the States” and in no event grant FERC “additional authority over the siting or construction of new intrastate transmission lines....”



## The local land owner's goal for transmission: “NHNWNH”

- Various principles for siting transmission:
  - It's ok to put it over there.
  - **But not here, no way, no how.**
  - **If you're going to put it here, put it underground.**
  - **And if you're going to take my land by eminent domain, I want more than “fair market value” for the strip of acreage you're taking.**
  - **And I want to plug in and get whatever juice I need whenever I want it.**



## The Indian tribe's goal for transmission: Ensuring a piece of the action

- **Various principles for tribal self-determination and sovereignty:**
  - **Interactions with tribal lands and resources requires:**
    - **Meaningful consultation with tribal governments**
    - **Meaningful opportunities to participate as partners in the energy resource development opportunities, including transmission corridors**
    - **Meaningful compensation for use of tribal lands – tied to negotiating process that recognizes that tribal lands are different from privately held land**



## The political scientist's goal for transmission: Making sausage as well as is humanly possible

- **Various principles for political resolution of transmission issues:**
  - **At the end of the day, resolution of transmission issues (legislation, planning, siting, cost support) needs to account for the iron laws of politics:**
    - “All politics is local,” Tip O’Neill
    - “What’s good economics is bad politics; what’s bad economics is good politics.” Eugene Baer
  - **There is no single rationale that motivates political participants’ positions on transmission issues**
    - Positions of politicians may shift from one rationale to another over time, without any particular consistency among the various pieces of the position

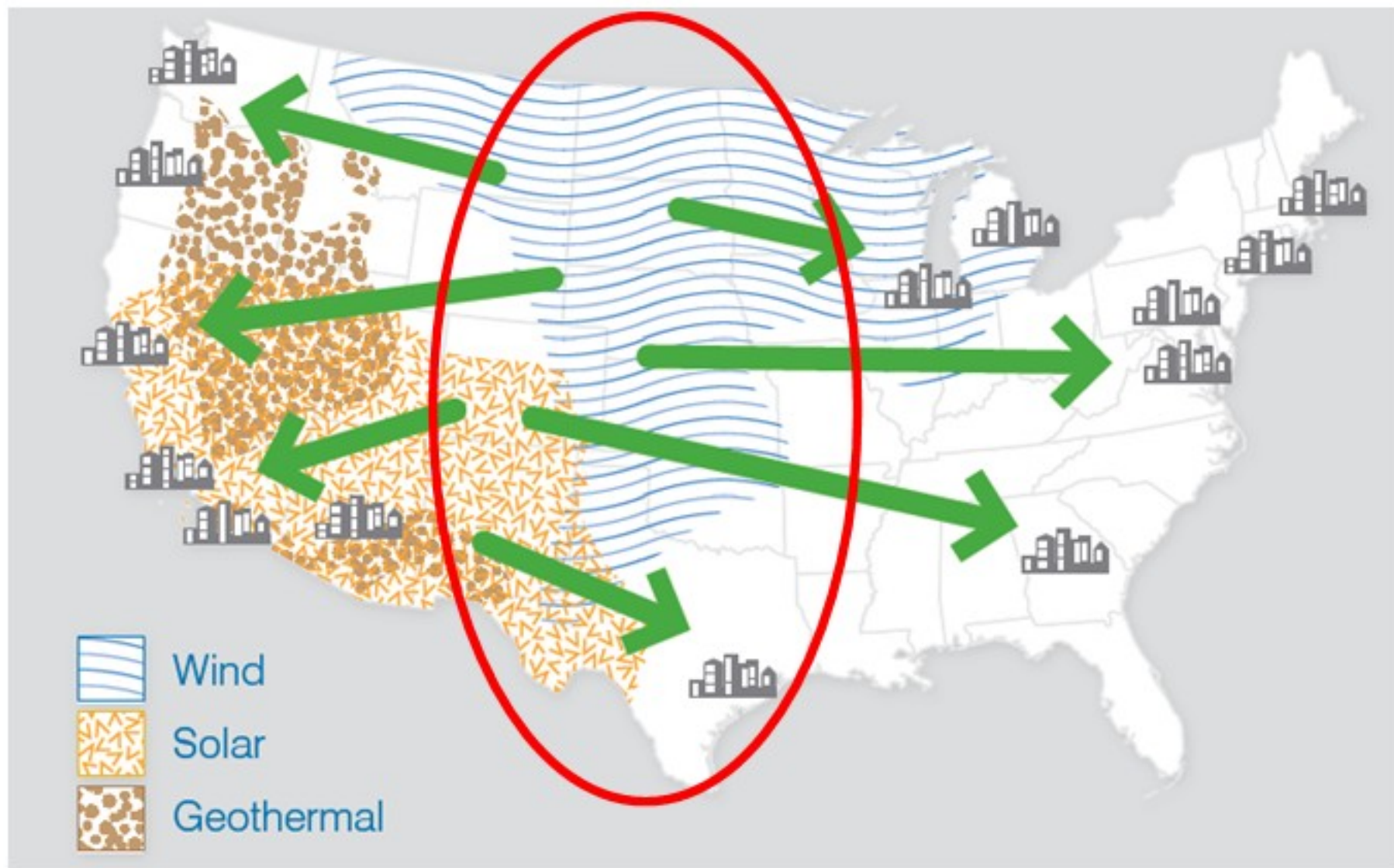
WE'VE AGREED!  
IT'S TIME TO FINALLY SITE A WIND FARM  
AND PRODUCE MORE ELECTRCITY  
FROM RENEWABLE ENERGY!



BUT NOT TO  
MY  
DISTRICT!!

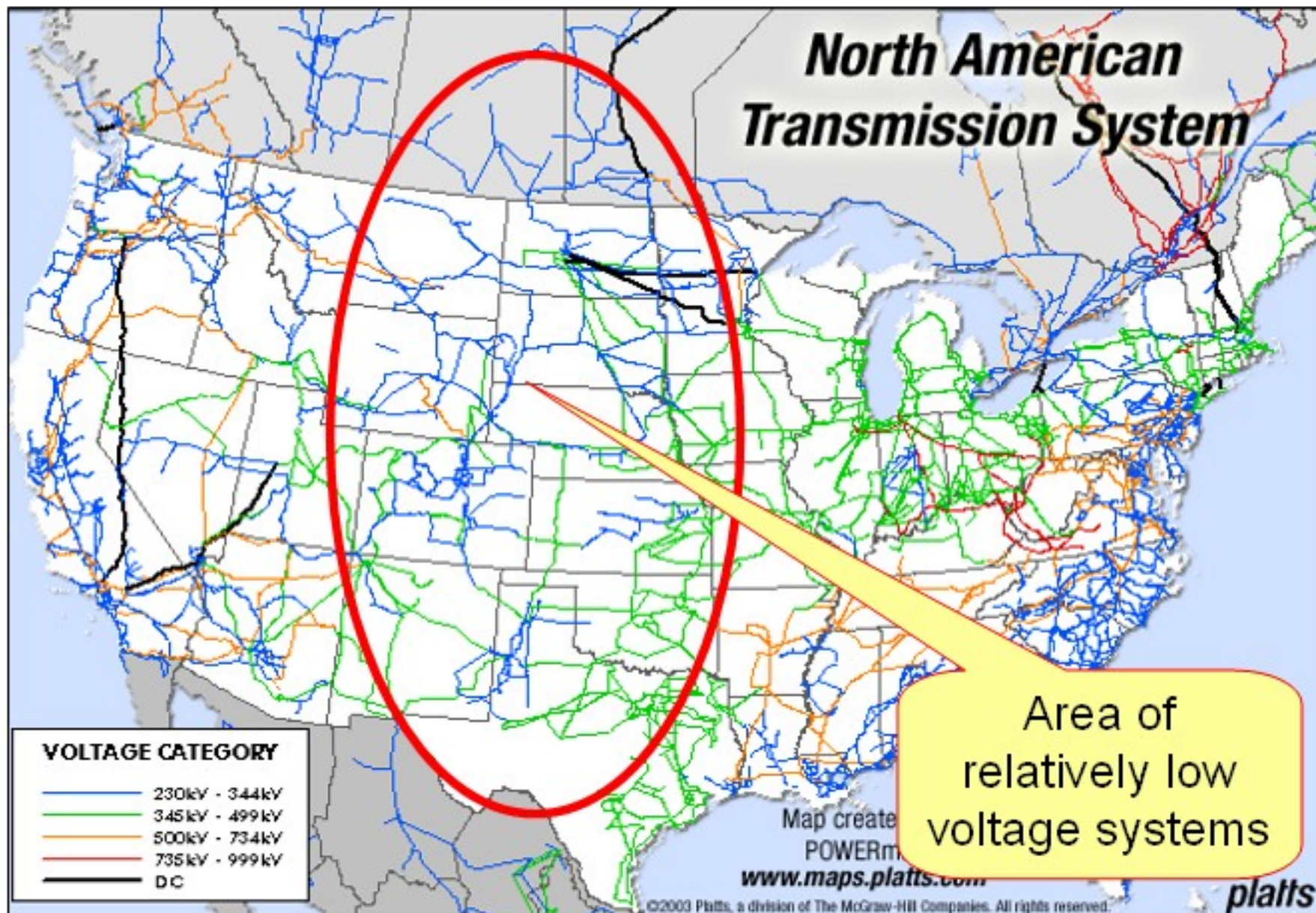


WE'VE AGREED! IT'S TIME TO FINALLY  
ADD MORE POWER LINES TO BRING  
WIND POWER FROM THE PLAINS  
TO DISTANT CONSUMERS

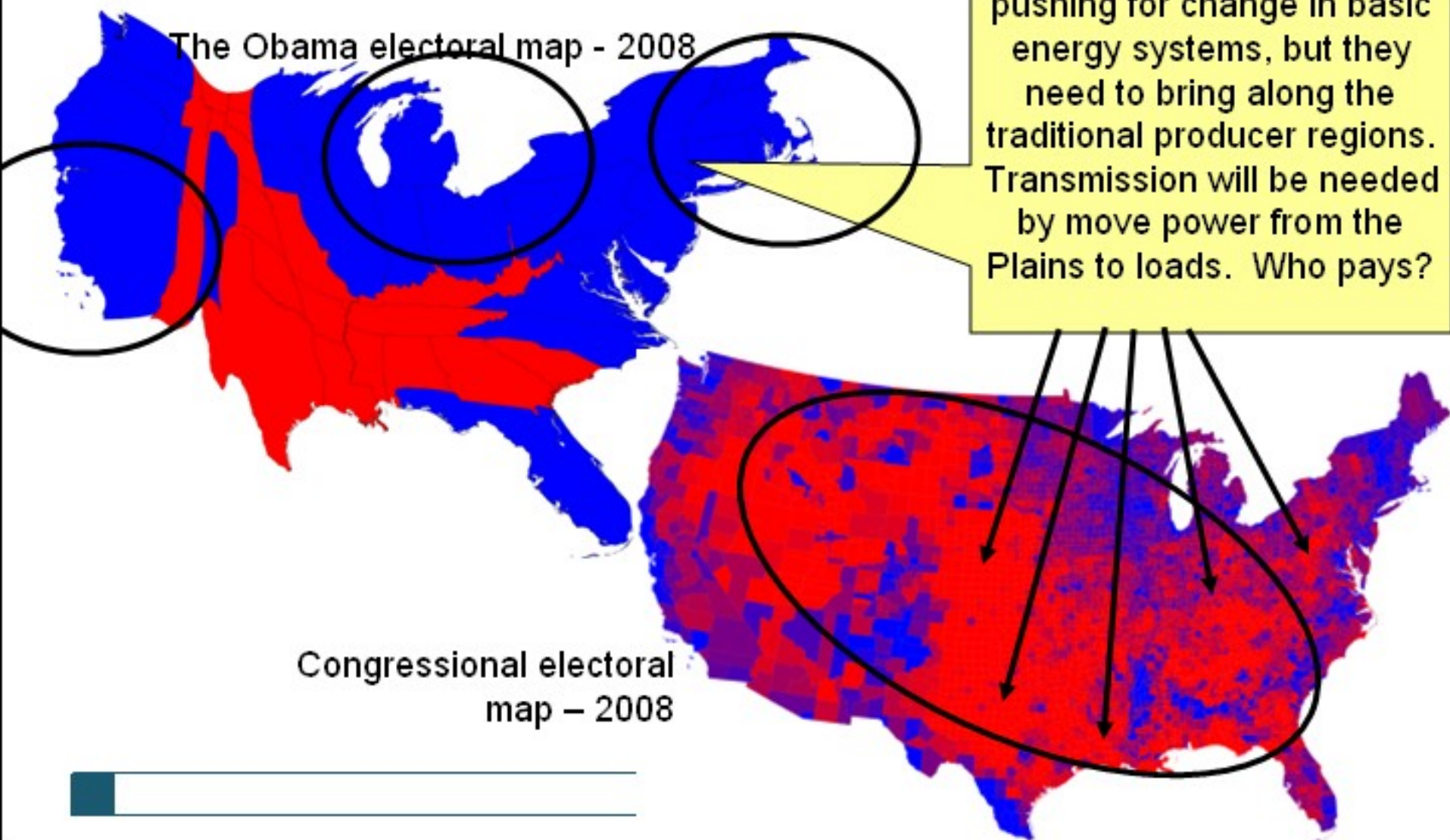


AWEA and SEIA, "Green Power Superhighways: Building a Path to America's Clean Energy Future," February 2009

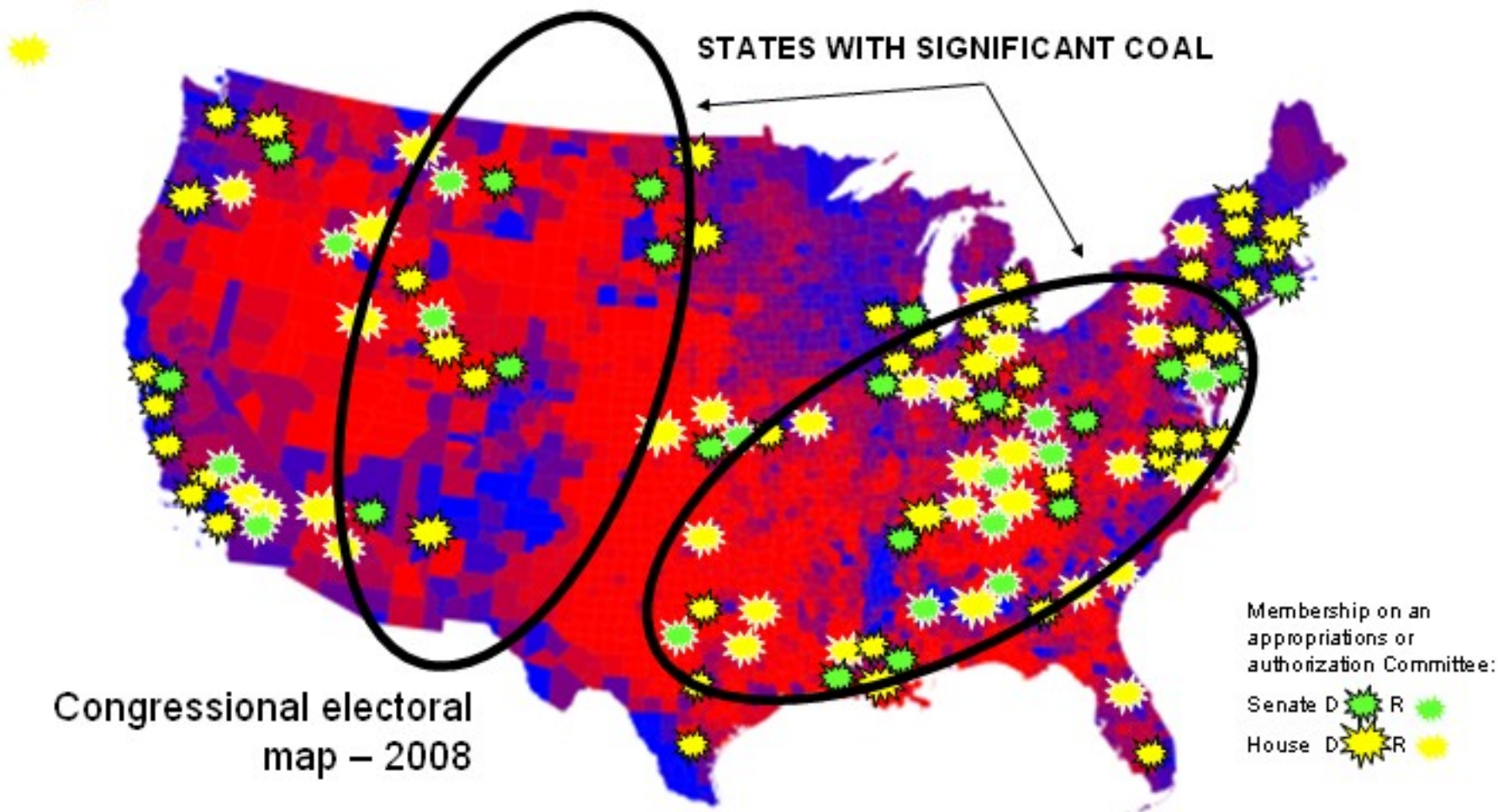
# A 21<sup>st</sup> Century Grid



## Washington support for “green energy”?



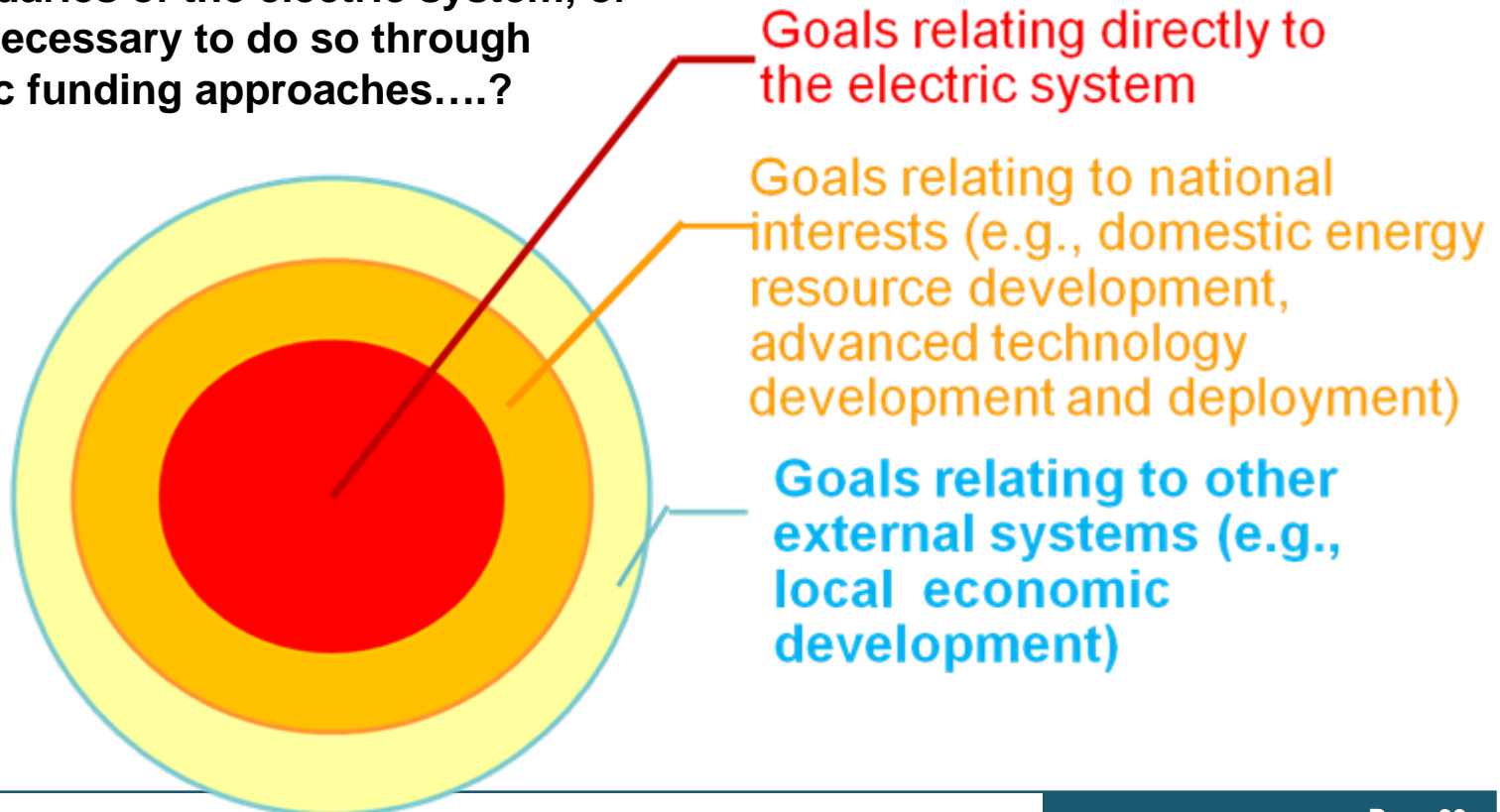
# Tough politics on carbon controls – with interesting implications for transmission deals?



## The mathematician's goal for transmission: Solving a simultaneous equation

- **Various principles for satisfying the array of others' goals?**

- **Is it possible to do so within boundaries of the electric system, or is it necessary to do so through public funding approaches....?**



## A few questions for the mathematician:

- **Should we only think about electric transmission issues only from within the “electricity box” – electric reliability, electric markets, internal benefits/cost?**
- **Should we use policy affecting electricity (and electricity prices) to address certain other strategic (external) issues, like national security, or economic development, or climate policy?**
- **If the nation views transmission for domestic energy resources as a strategic issue, should it be paid for through electricity prices?**
  - If it's so strategic, is it still a “service,” paid for by users of the service?
  - Why should electric regulators be adjudicating rates (since the beneficiaries and payers are not necessarily well aligned)?
  - If it's a national issue, why socialize the costs within a single interconnection?
  - If a region wants to stimulate economic development (e.g., local jobs, taxes) with its renewable resources, should it also support transmission with its funds?

## A few questions for the mathematician:

- Can we find a way to give preference to transmitting electrons produced by renewable power? (?)
- To qualify as a renewable “feeder line,” is there any length limit?
- Should the federal government use public funding to support transmission tied to renewables on “public trust” federal lands?
- Is there something special about Western interstate commerce as opposed to Eastern interstate commerce that warrants a different treatment for transmission under an amended FPA?
  - Do the three interconnections really view themselves as regions?
- If consumers end up paying for high voltage transmission built to bring power from far away, how do they also get the zero-fuel-price energy benefits (especially in RTO markets with gas on the margin)?



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