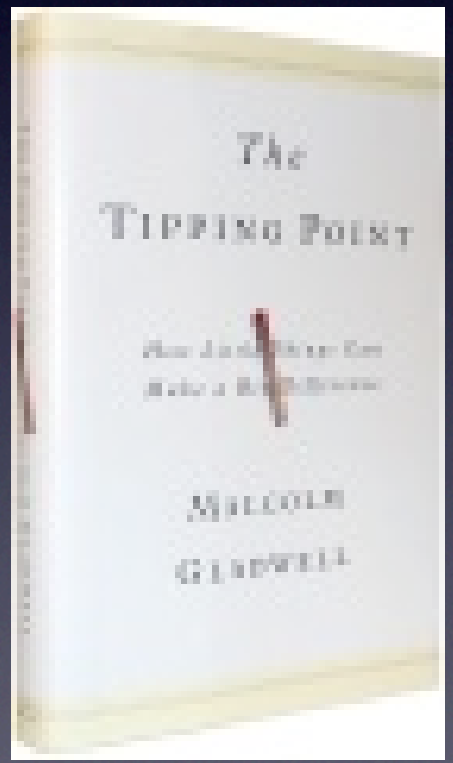
Transmission in the West

Bob Anderson
West Wind Wires

Wind Powering America
2007 All-States Summit
Los Angeles
June 7, 2007

The tipping point ...

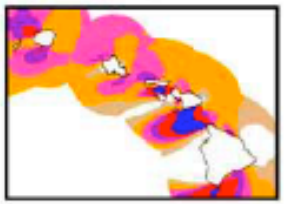
- ... has been passed--carbon policy is inevitable
- Carbon policy needs wind
- AWEA vision--320 GW of wind
  - 12 GW today
- Massive transmission needed



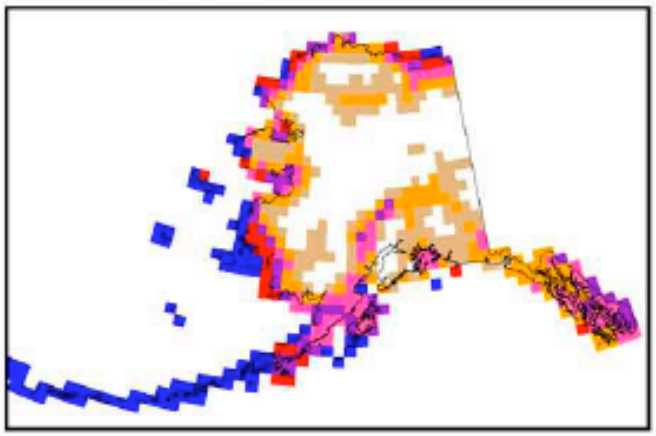
Composite Wind Resource Map

NREL Updated Maps:
Arizona (2003)
California (2002)
Colorado (2004)
Connecticut (2001)
Delaware (2002)
Hawaii (2004)
Idaho (2002)
Illinois (2001)
Indiana (2004)
Maine (2001)
Maryland (2002)
Massachusetts (2001)
Michigan (2004)
Missouri (2005)
Montana (2002)
Nebraska (2005)
Nevada (2003)
New Jersey (2002)
New Hampshire (2001)
New Mexico (2003)
North Carolina (2002)
North Dakota (2000)
Ohio (2004)
Oregon (2002)
Pennsylvania (2002)
Rhode Island (2001)
South Dakota (2001)
Texas mesas (2000)
Utah (2003)
Vermont (2001)
Virginia (2002)
Washington (2002)
West Virginia (2002)
Wyoming (2002)

Existing 765 kV
New 765 kV
AC-DC-AC Link



The remaining states use data from the 1987 "Wind Energy Atlas of the United States".



Transmission Lines
Voltage (kV)
345 - 499
500 - 699
700 - 799
1000 (DC)

Source: POWERmap, powermap.platts.com, ©2007 Platts, a division of the McGraw-Hill Companies

Wind Power Classification

Wind Power Class	Resource Potential	Wind Power Density at 50 m W/m^2	Wind Speed [a] at 50 m m/s	Wind Speed [a] at 50 m mph
2	Marginal	200 - 300	5.6 - 6.4	12.5 - 14.3
3	Fair	300 - 400	6.4 - 7.0	14.3 - 15.7
4	Good	400 - 500	7.0 - 7.5	15.7 - 16.8
5	Excellent	500 - 600	7.5 - 8.0	16.8 - 17.9
6	Outstanding	600 - 800	8.0 - 8.8	17.9 - 19.7
7	Superb	800 - 1600	8.8 - 11.1	19.7 - 24.8

[a] Wind speeds are based on a Weibull k value of 2.0

U.S. Department of Energy
National Renewable Energy Laboratory

NREL

19-APR-2007 1.5.8

How to get there?

- Federal pre-emption?
- Or state/regional

A few current happenings

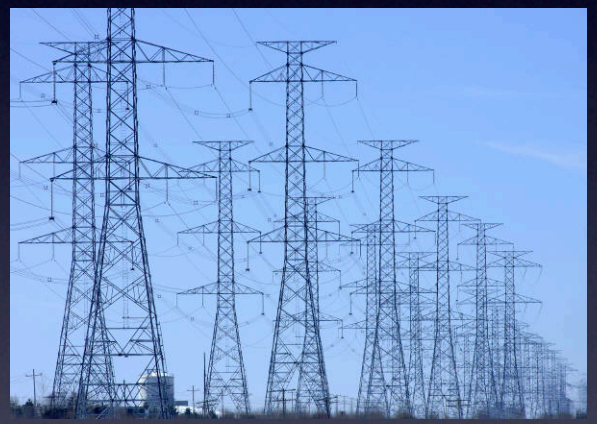
- FERC Order 890
- WECC--TEPPC
- Subregional planning
- Mega Projects
- DOE NITCs
- Palo Verde-Devers II denied by ACC

FERC Order 890

- February 16, 2007
- Imbalance penalties like BPA's
- Redispatch/Condition firm service
- Regional transmission planning
  - 9 Principles
  - Regional strawmen

890 Planning principles

- Coordination
- Openness
- Transparency
- Information exchange
- Comparability
- Dispute resolution
- Regional participation
- Economics
- Cost allocation



WECC

- Transmission Expansion Planning Policy Committee (TEPPC)
  - Technical Advisory Committee (TAS)

Subregional planning

- SWAT
- NTAC
- STEP
- RMATS
- CAISO
- CCPG

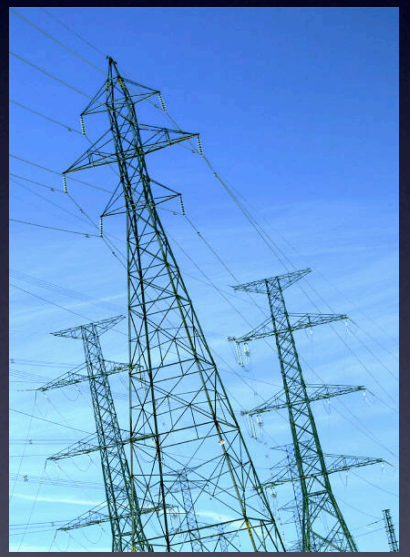
Mega Projects

- Sun Zia
- TransWest Express
- Frontier
- Northern Lights
- ....

TransWest Express

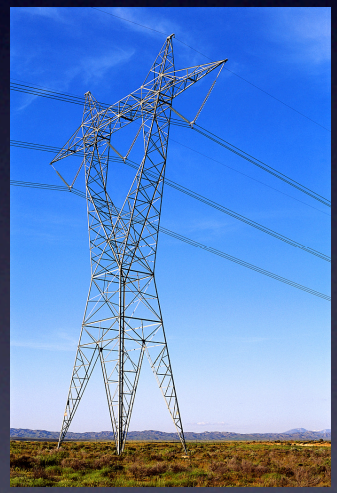
Other grid orgs

- TransElect
- NTTG
- Columbia Grid
- .....

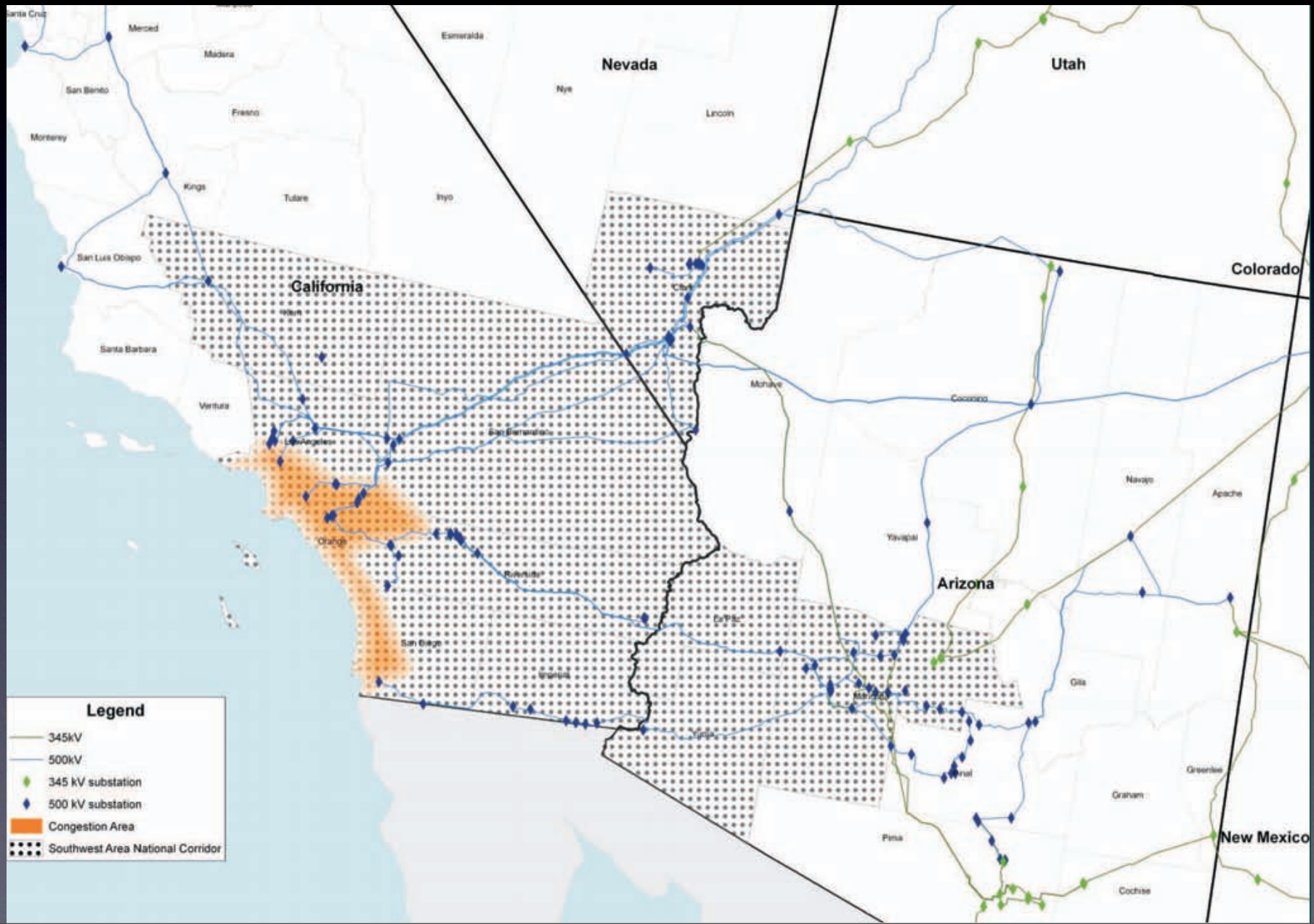


National Interest Transmission Corridors

- EPAct 2005
- Corridors proposed
- Public meetings
  - May 17, 2007 San Diego
  - June 20, 2007 Las Vegas
  - June 21, 2007 Phoenix
- Comments due July 6, 2007



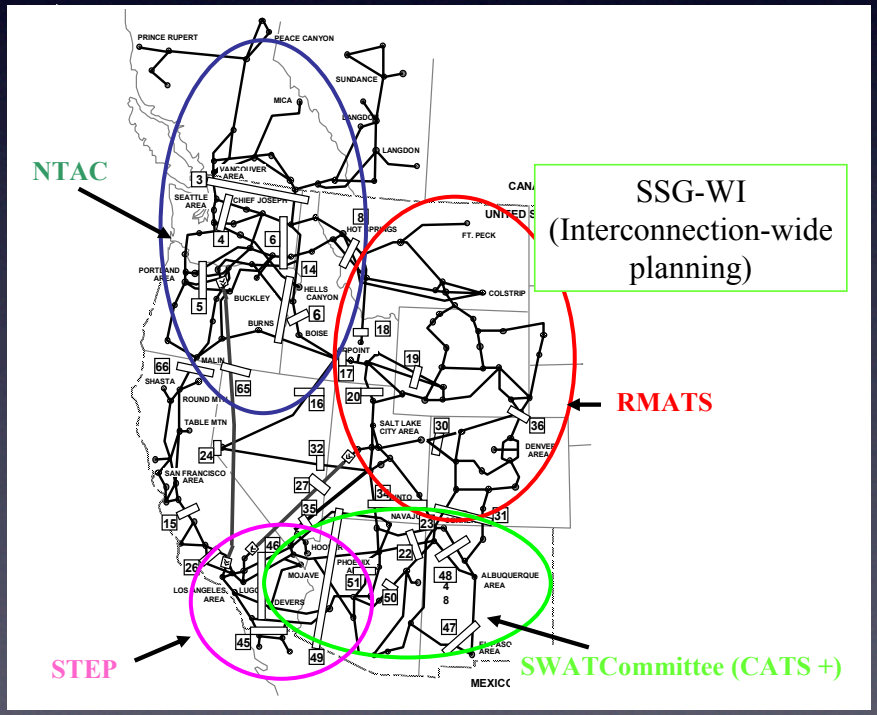
Southwest NITC



Palo Verde-Devers II

- REGULATORS REJECT “EXTENSION CORD FOR CALIFORNIA”
- Commissioner: “I don’t want Arizona to become an energy farm for California.

Think globally, act regionally



Be there or be square!

- WGA / NWCC / GEA Summit: Increasing Renewable Energy in the Western Grid
- September 27-28, 2007
  Ft. Collins, Colorado
- www.nationalwind.org

Who ya gonna call?

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