

YOU CANNOT MAKE THIS STUFF UP

Harvard Electricity Policy Group

Lauren Azar, Azar Law LLC

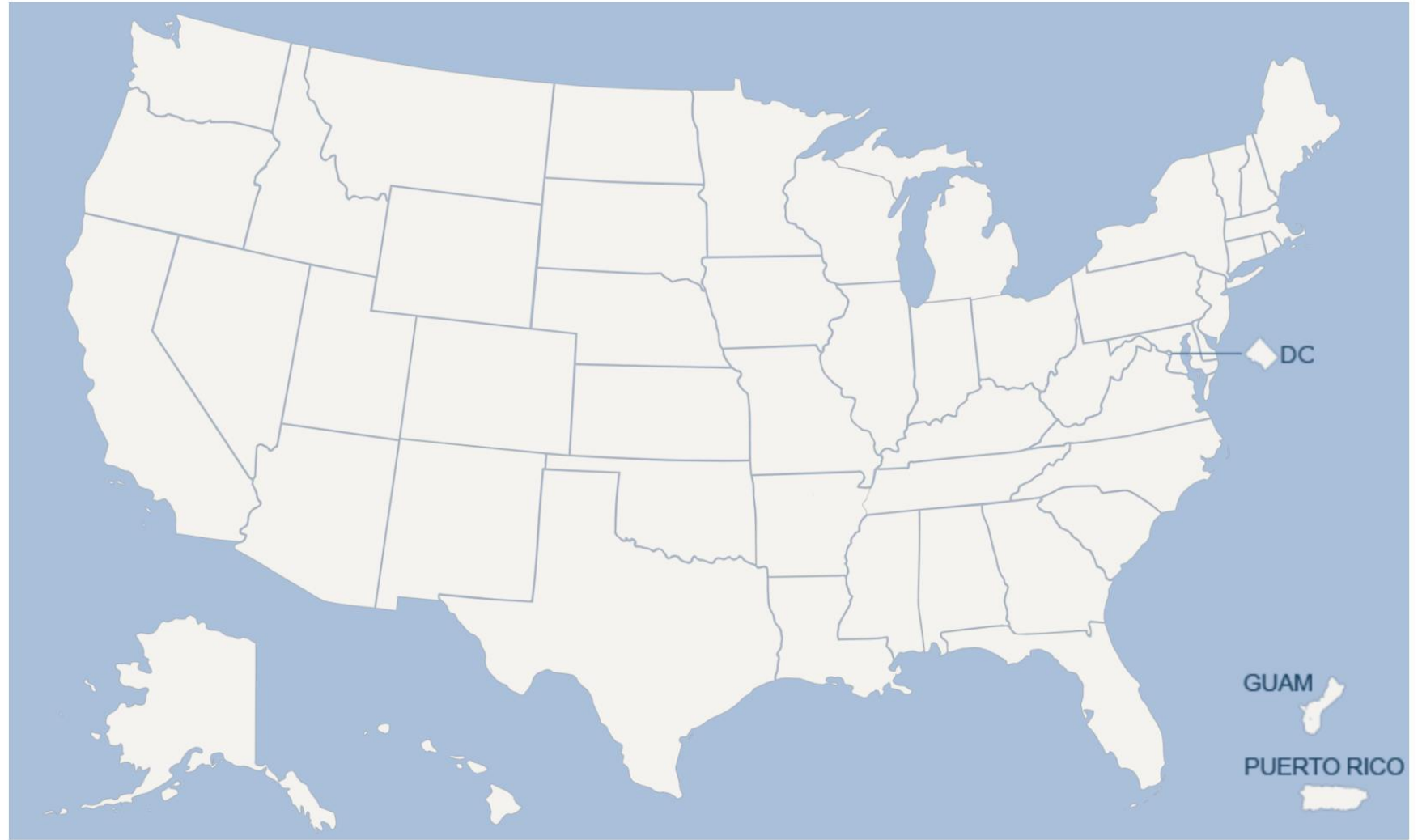
March 14, 2023





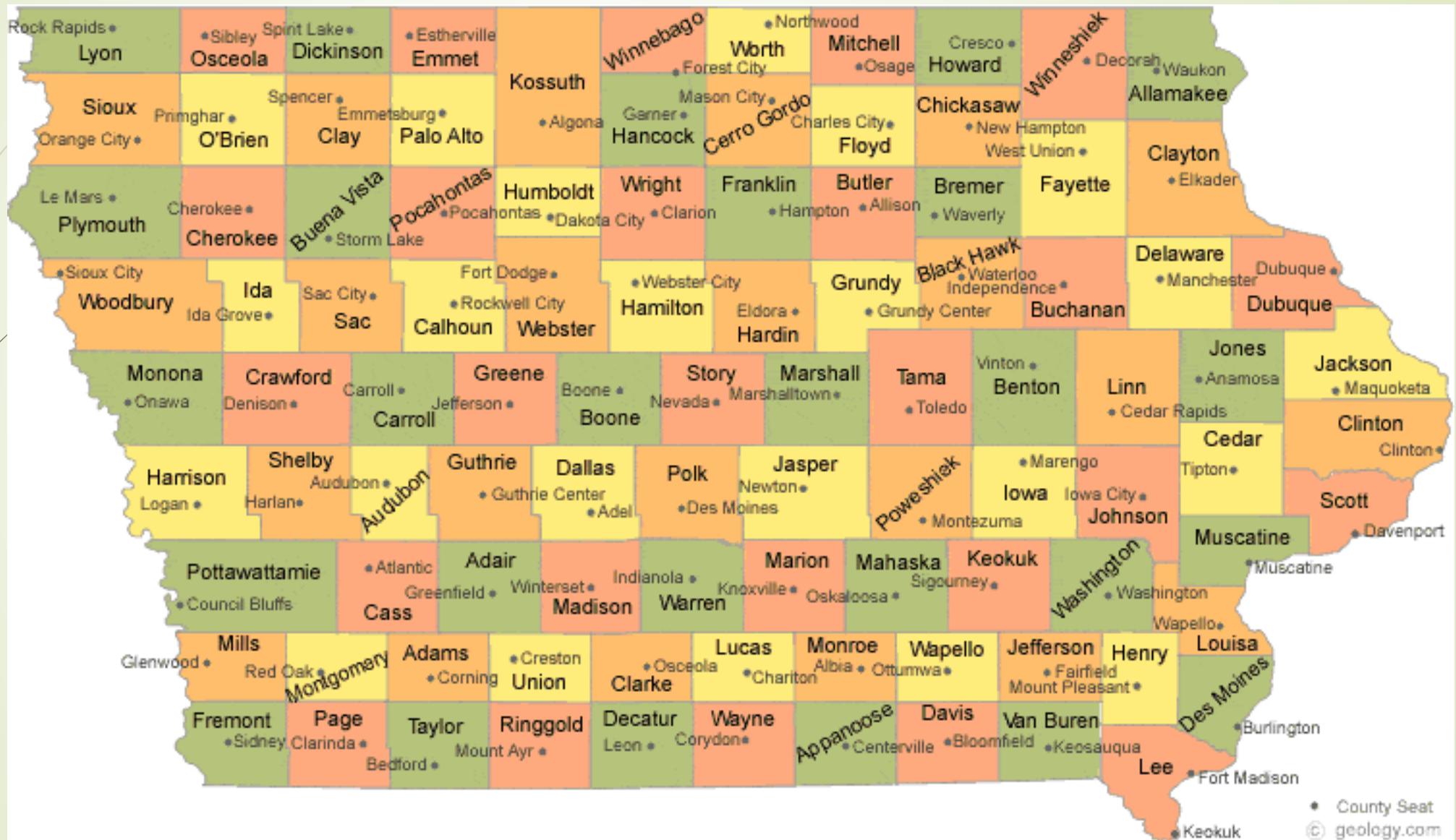
At a national level,
rational solutions cannot emerge from
an irrational regulatory framework.....

Regulatory Commissions



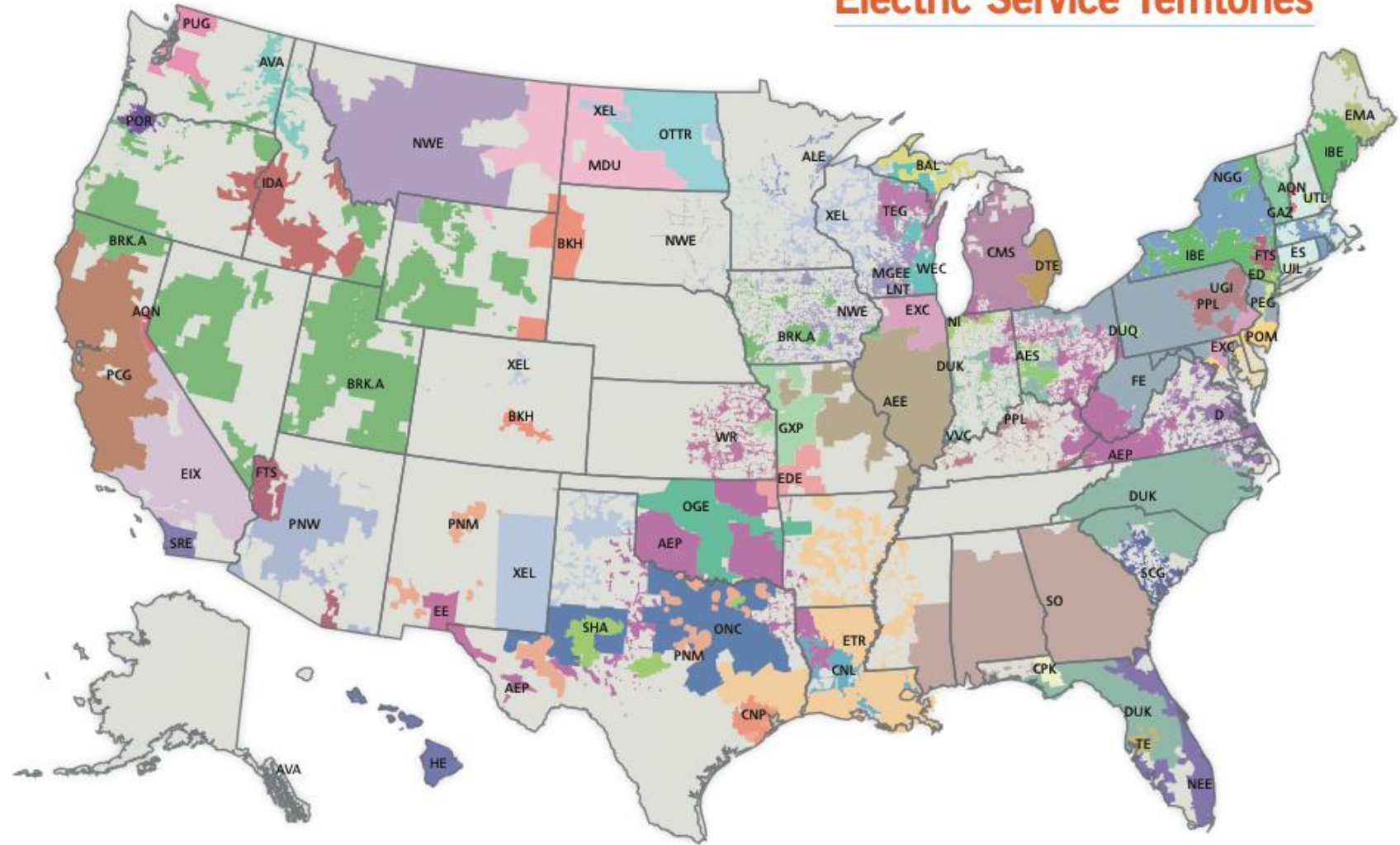
Source: NARUC

Municipalities that have regulatory authority over transmission – Example Iowa



Source: geology.com

Electric Service Territories



(AEE) Ameren Corp.	(CMS) CMS Energy Corp.	(EDE) Empire District Electric Co.	(GZ) Gaz Metro	(NGG) National Grid plc	(PNW) Pinnacle West Capital Corp.	(TE) TECO Energy Inc.
(AEP) American Electric Power Co.	(CNL) Cleco Corp.	(EE) El Paso Electric Co.	(GXP) Great Plains Energy	(NI) NiSource Inc.	(POM) Pepco Holdings Inc.	(TEG) Integrys Energy Group Inc.
(AES) AES Corp.	(CNP) CenterPoint Energy, Inc.	(ED) Edison International	(HE) Hawaiian Electric Industries	(NWE) NorthWestern Corp.	(PPL) PPL Corp.	(UGI) UGI Corp.
(ALE) ALLETE Inc.	(CPK) Chesapeake Utilities Corp.	(EMA) Emera Inc.	(IBE*) Iberdrola SA	(OGE) OGE Energy Corp.	(PUG*) Puget Holdings LLC	(UIL) UIL Holdings Corp.
(AQN) Algonquin Power & Utilities Corp.	(D) Dominion Resources Inc.	(ES) Eversource Energy	(IDA) IDACORP Inc.	(ONC*) Oncor Electric Delivery Co. LLC	(PPL) PPL Corp.	(UIL) UIL Corp.
(AVA) Avista Corp.	(DTE) DTE Energy Co.	(ETR) Entergy Corp.	(LNT) Alliant Energy	(OTTR) Otter Tail Corp.	(SCG) SCANA Corp.	(VCC) Veeva Corp.
(BAL*) Balfour Beatty plc	(DUK) Duke Energy Corp.	(EXC) Exelon Corp.	(MDU) MDU Resources Group Inc.	(PCG) PG&E Corp.	(SHA*) Sharyland Utilities	(WEC) Wisconsin Energy Corp.
(BKH) Black Hills Corp.	(DUQ*) Duquesne Light Holdings Inc.	(FE) FirstEnergy Corp.	(MGEE) MGE Energy Inc.	(PEG) Public Svc Enterprise Group	(SO) Southern Co.	(WR) Westar Energy Inc.
(BRK.A) Berkshire Hathaway Energy	(ED) Consolidated Edison Inc.	(FTS) Fortis Inc.	(NEE) NextEra Energy Inc.	(PNM) PNM Resources Inc.	(SRE) Sempra Energy	(XEL) Xcel Energy Inc.

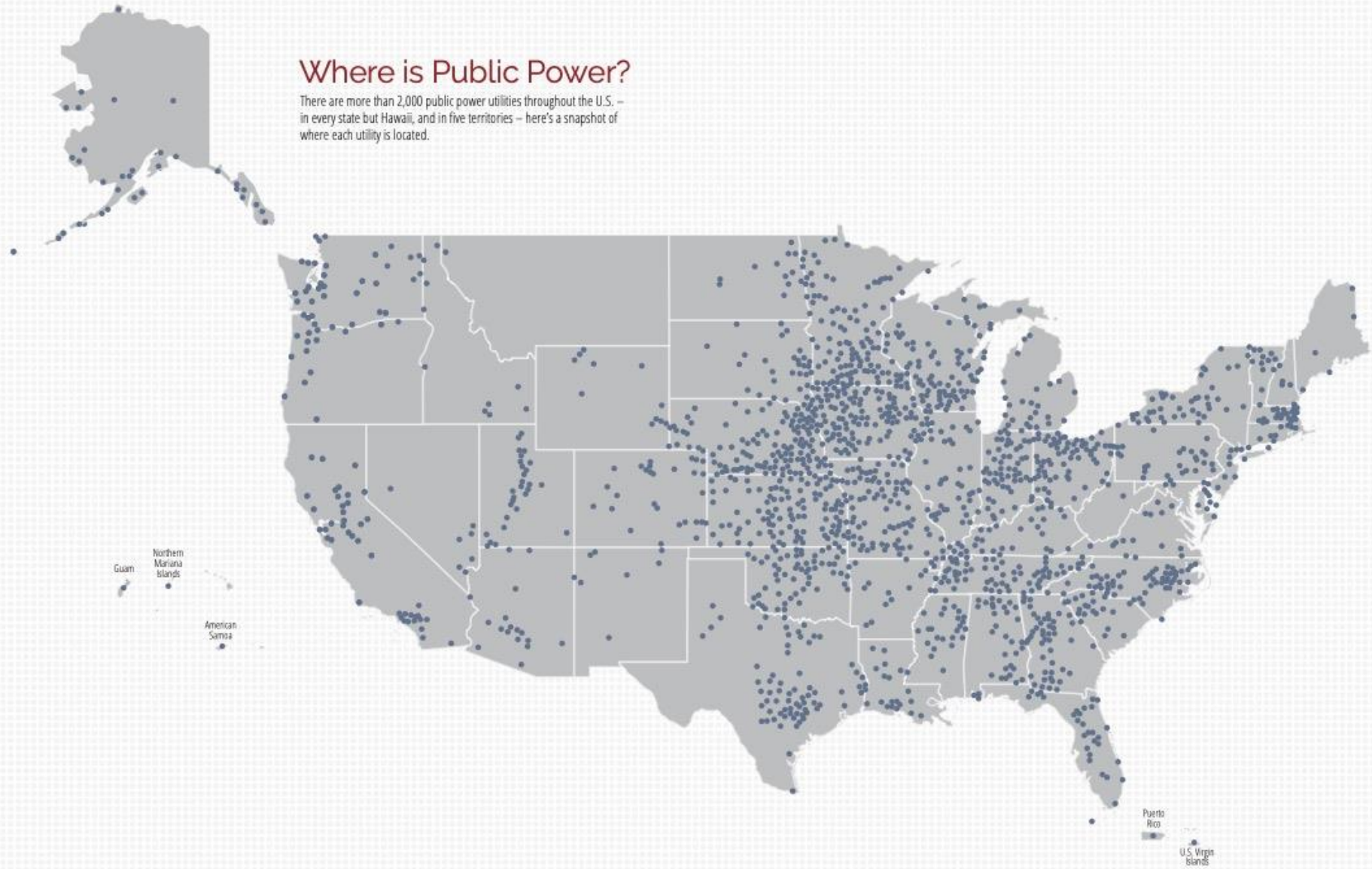
As of April 1, 2015. All companies are represented by trading tickers unless noted by (*). | Excludes select small electric service territories.

SNLEnergy

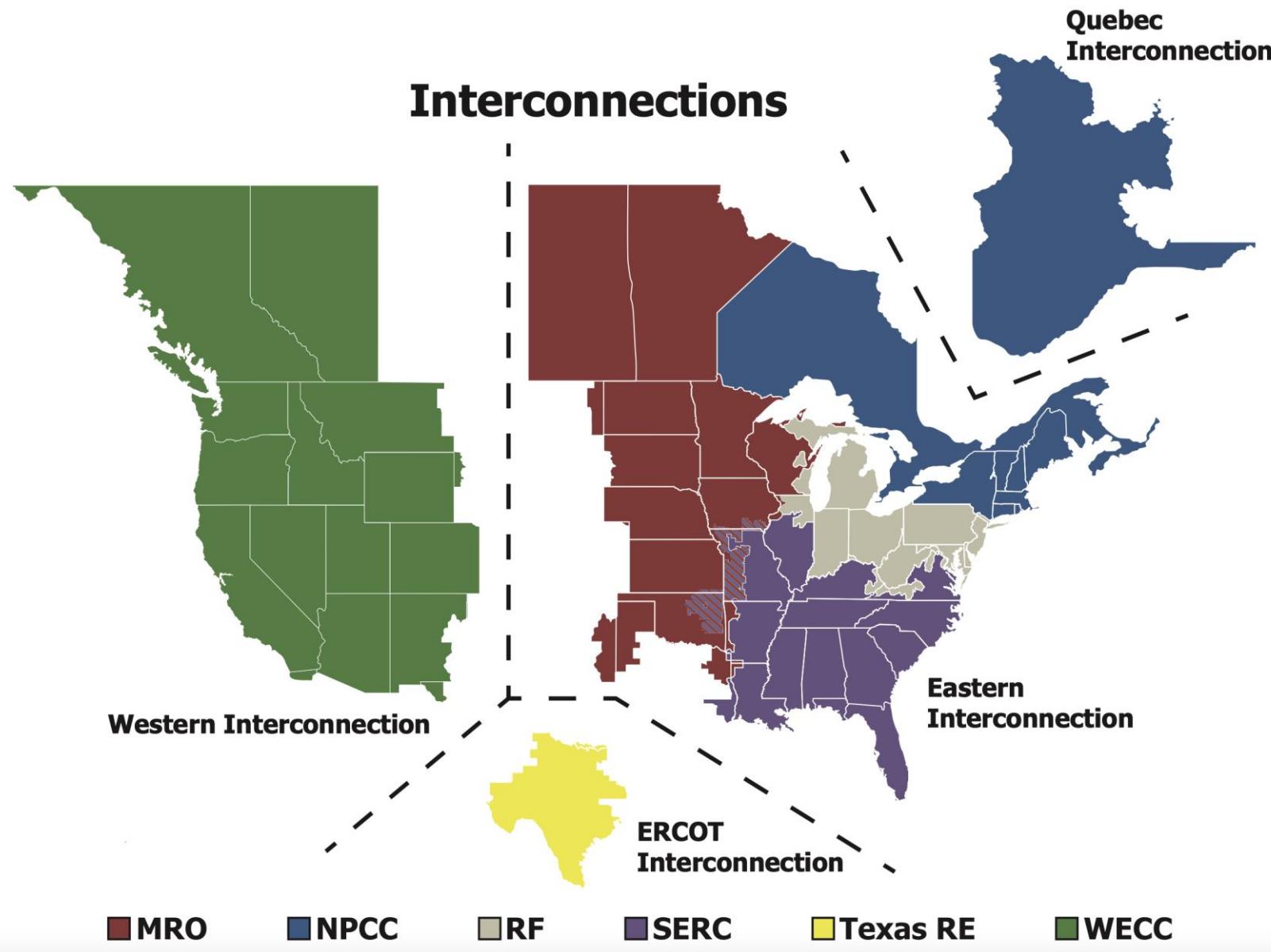


Where is Public Power?

There are more than 2,000 public power utilities throughout the U.S. – in every state but Hawaii, and in five territories – here's a snapshot of where each utility is located.



Interconnections

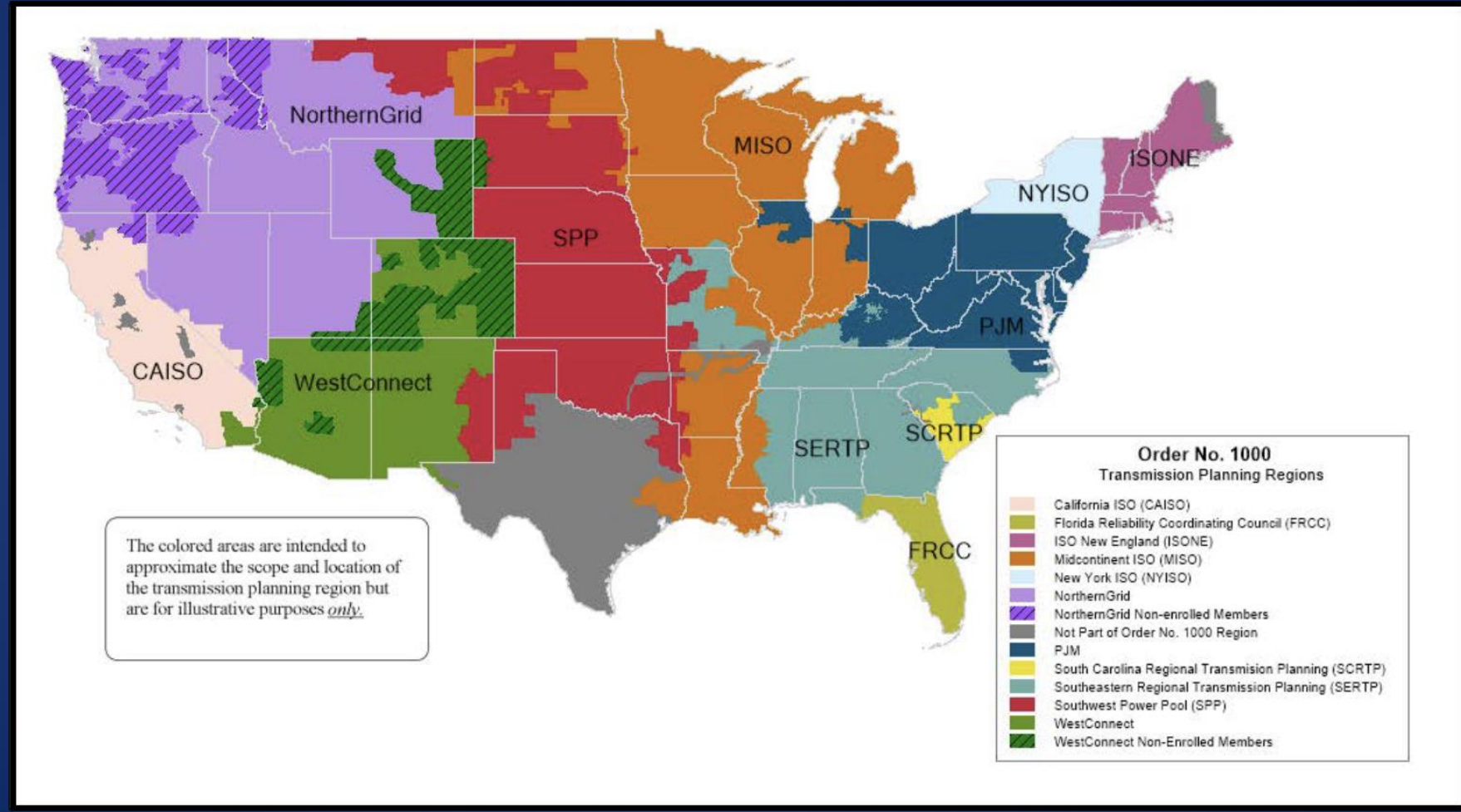


ISO/RTO Growth before 1996

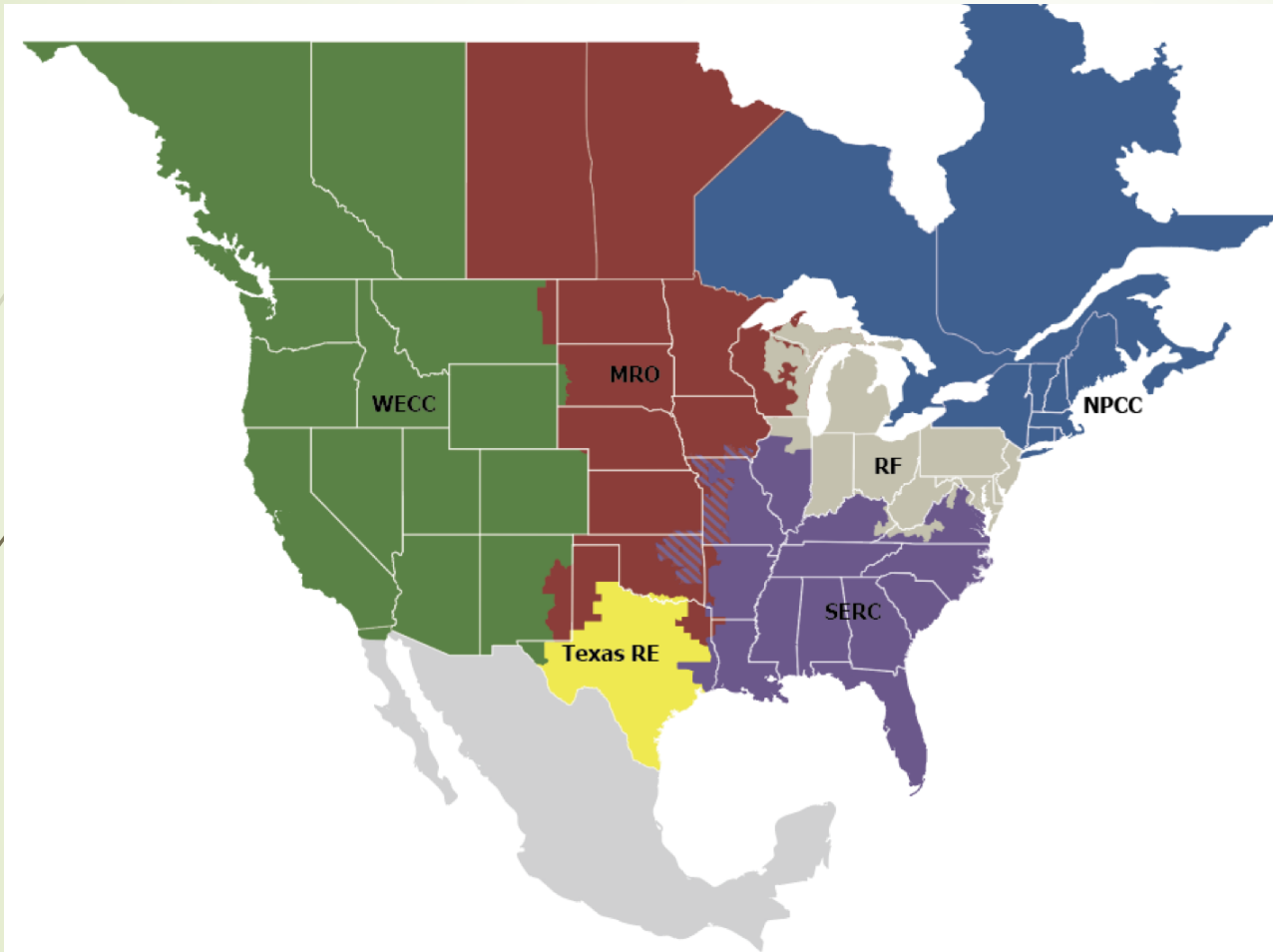


Source: <https://isorto.org>

Order No. 1000 Transmission Planning Regions

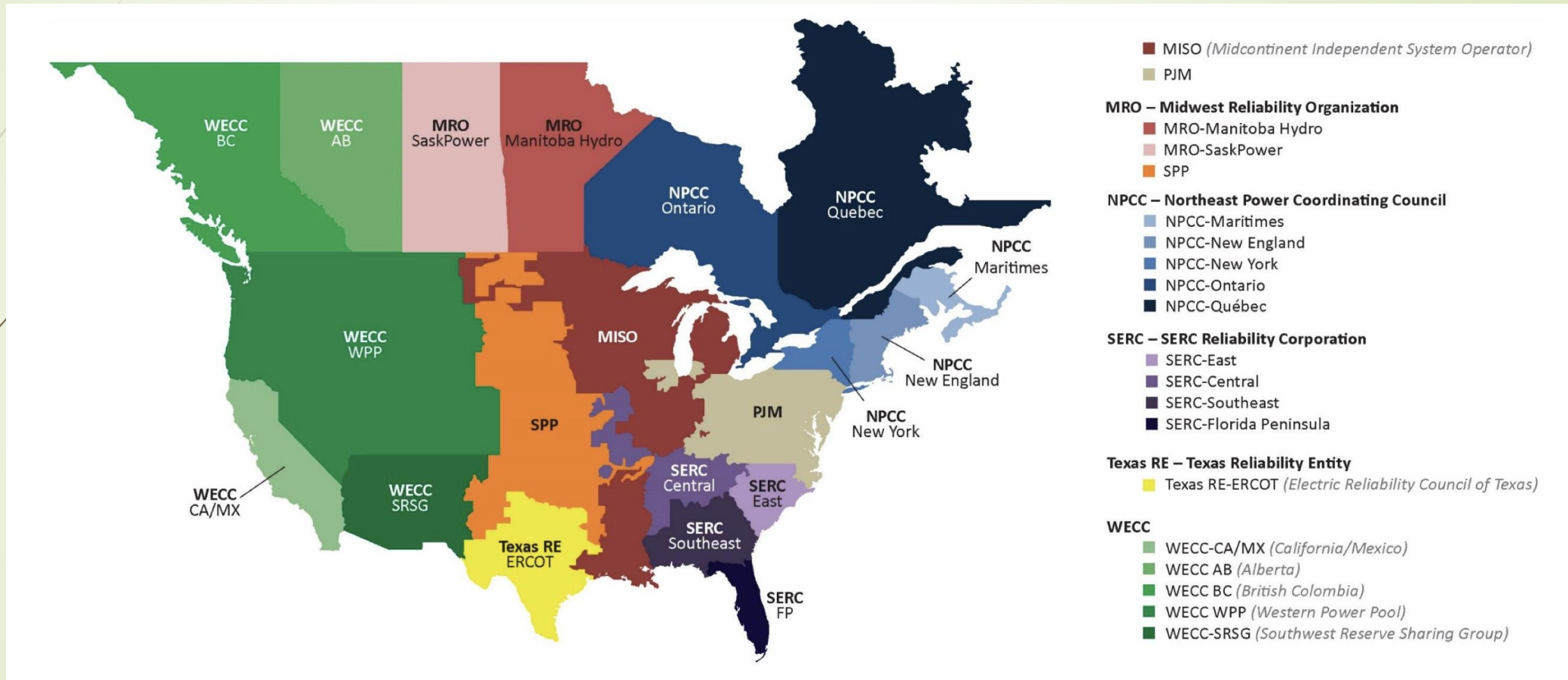


NERC Reliability Organizations

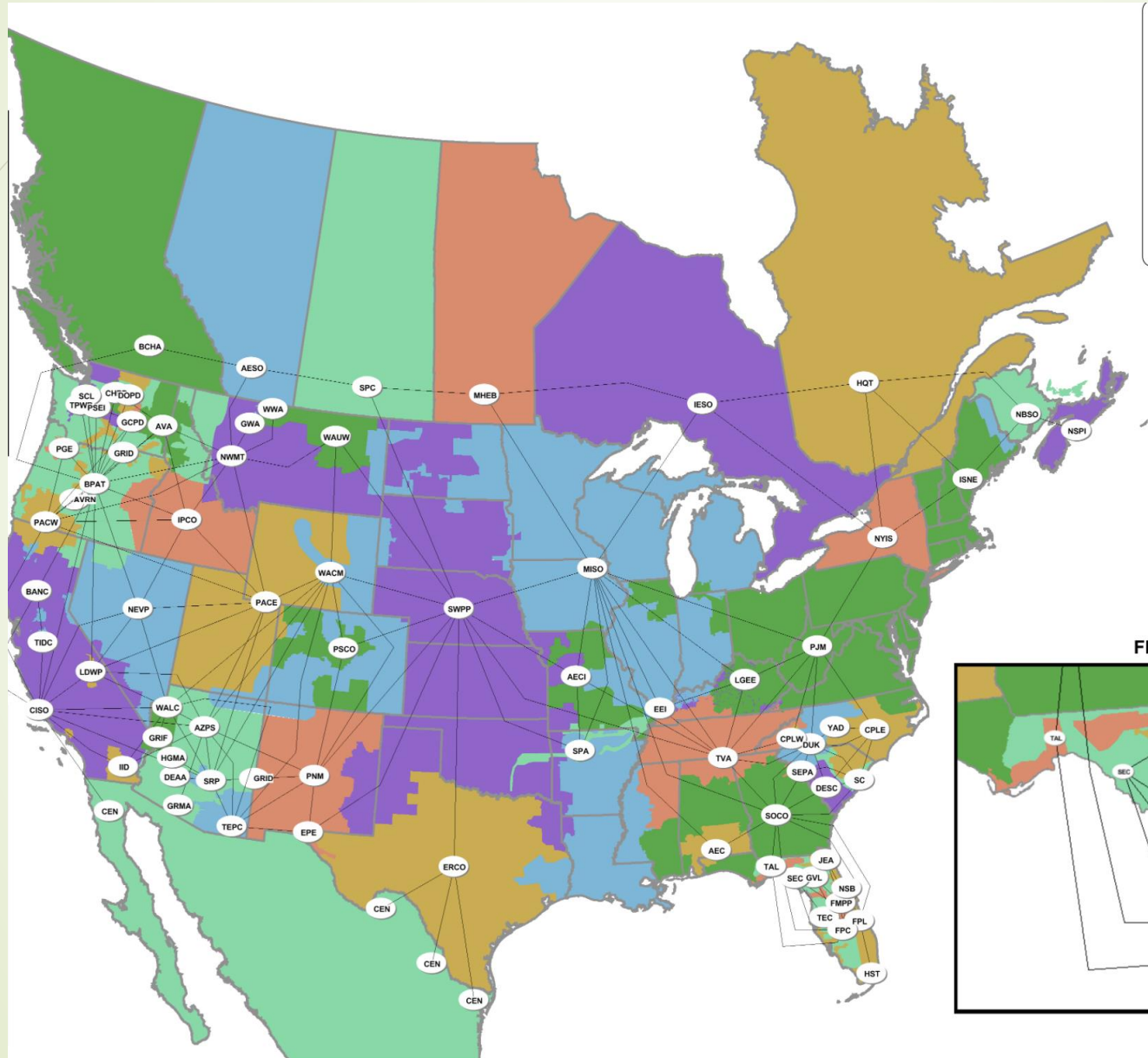


MRO	Midwest Reliability Organization
NPCC	Northeast Power Coordinating Council
RF	ReliabilityFirst
SERC	SERC Reliability Corporation
Texas RE	Texas Reliability Entity
WECC	WECC

NERC Assessment Areas



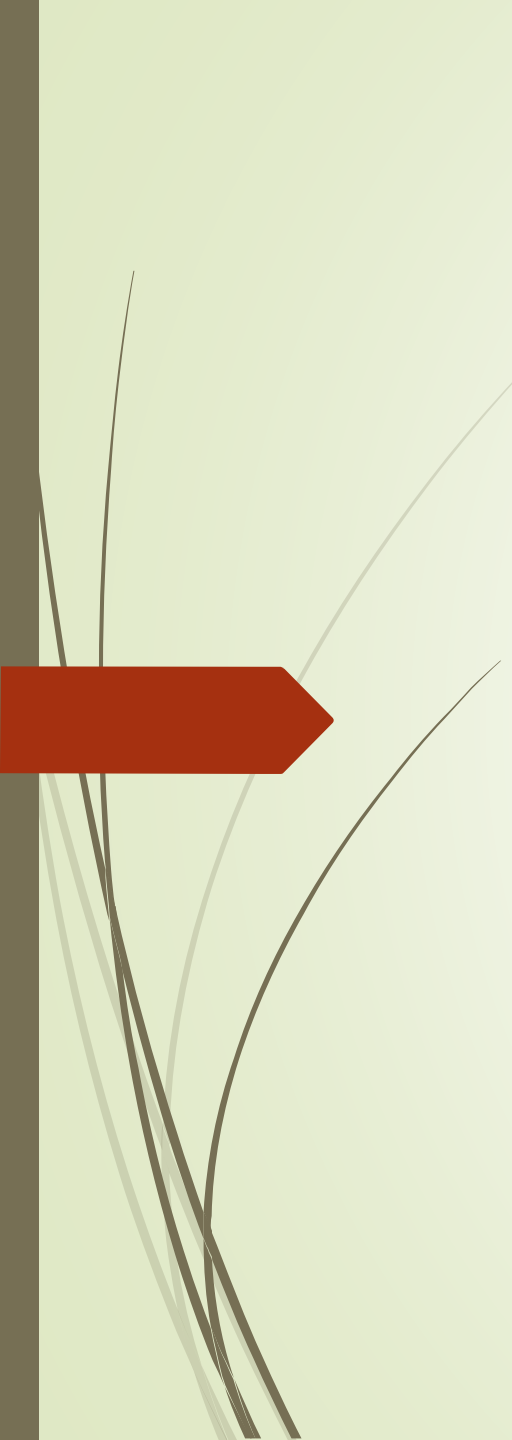
NERC: Balancing Authorities as of October 2019



Source:
<https://www.nerc.com/AboutNERC/keyplayers/PublishingImages/BA%20Bubble%20Map%2020191106.tif>

What's Broken

- Too many entities with blurred authorities and the ability to just say “no”
- Decision-makers with interests that conflict with the national interest, e.g. fiduciary duty to their shareholders or to their members
- State and local decision-makers whose authority is local and cannot recognize regional and/or national interests
- No single entity that is actively designing (interregional and cross-interconnection) infrastructure that is actionable and in the national interest
- Lacking a nexus between those who could design lines in the national interest and those who can mandate someone build them
- Markets that are not free and cannot inform decisions needed for a grid 20-years out
- Infrastructure that takes 10-15 years to design and construct
- Few entities that plan 20-years out using scenario planning
- No one wants to pay for infrastructure in the national interest
- Polarized nation and a politicized debate over what is in the national interest



Yesterday: Our regulatory framework was rational when we were transporting fuels to central station generators near load, and load was predictable.

Tomorrow: Weather is the fuel, extreme weather events are increasing, load is dynamic and growing, and we need a fundamentally different national grid.

Today: We are in the messy middle and need to recognize that yesterday's tools will not enable tomorrow's infrastructure.

Tomorrow's Fuels

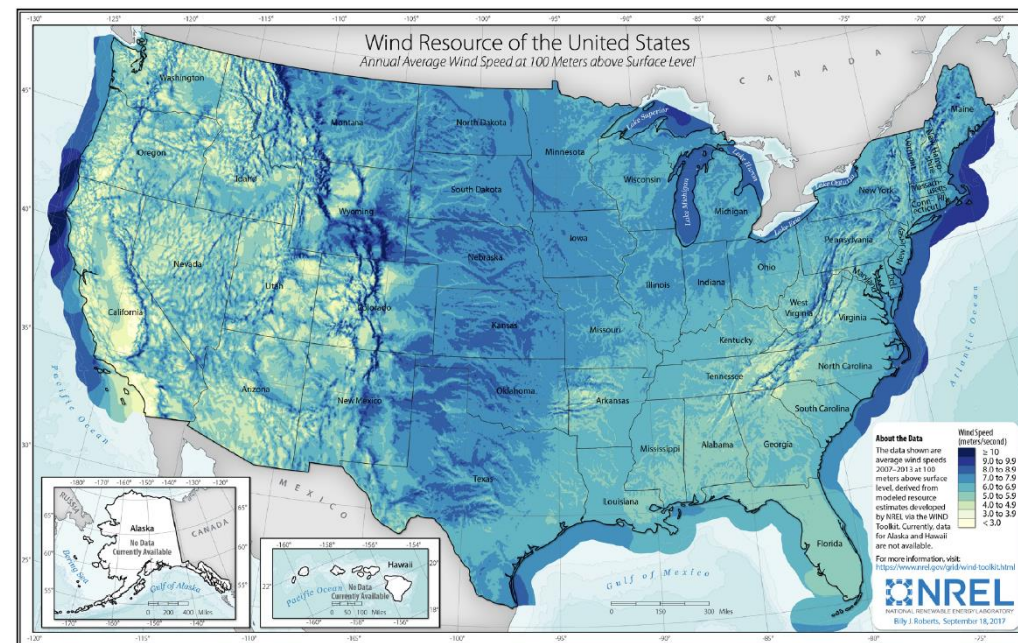


Figure 3. Wind resource in the United States in 2012

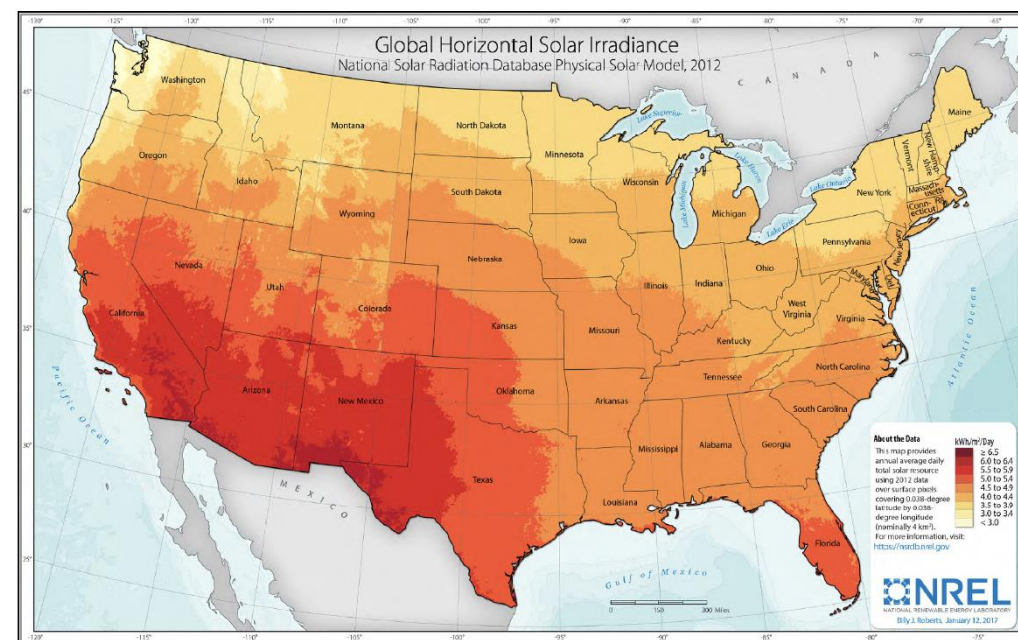
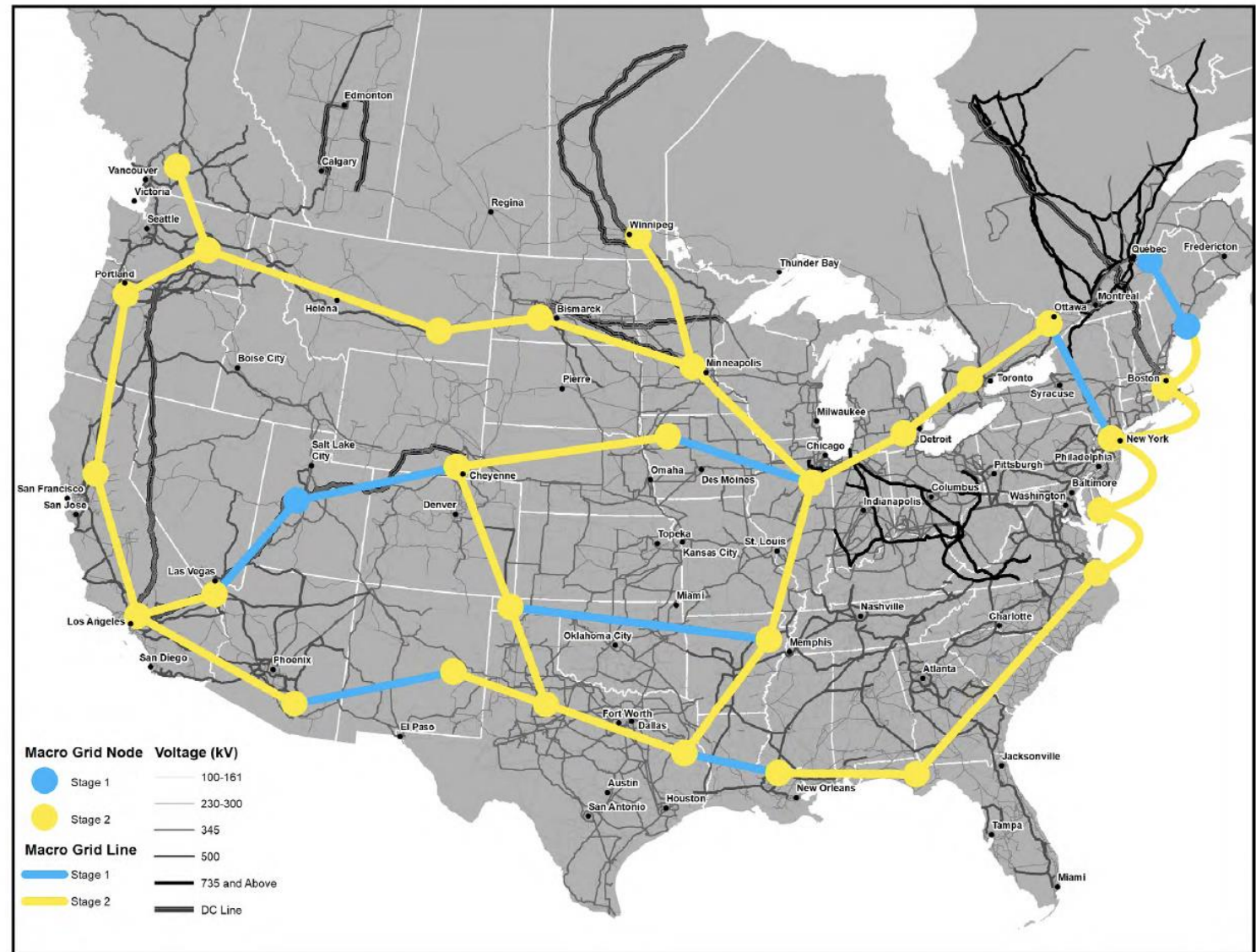


Figure 4. Solar resource in the United States in 2012

Tomorrow's Grid



ZeroByFifty Macrogrid

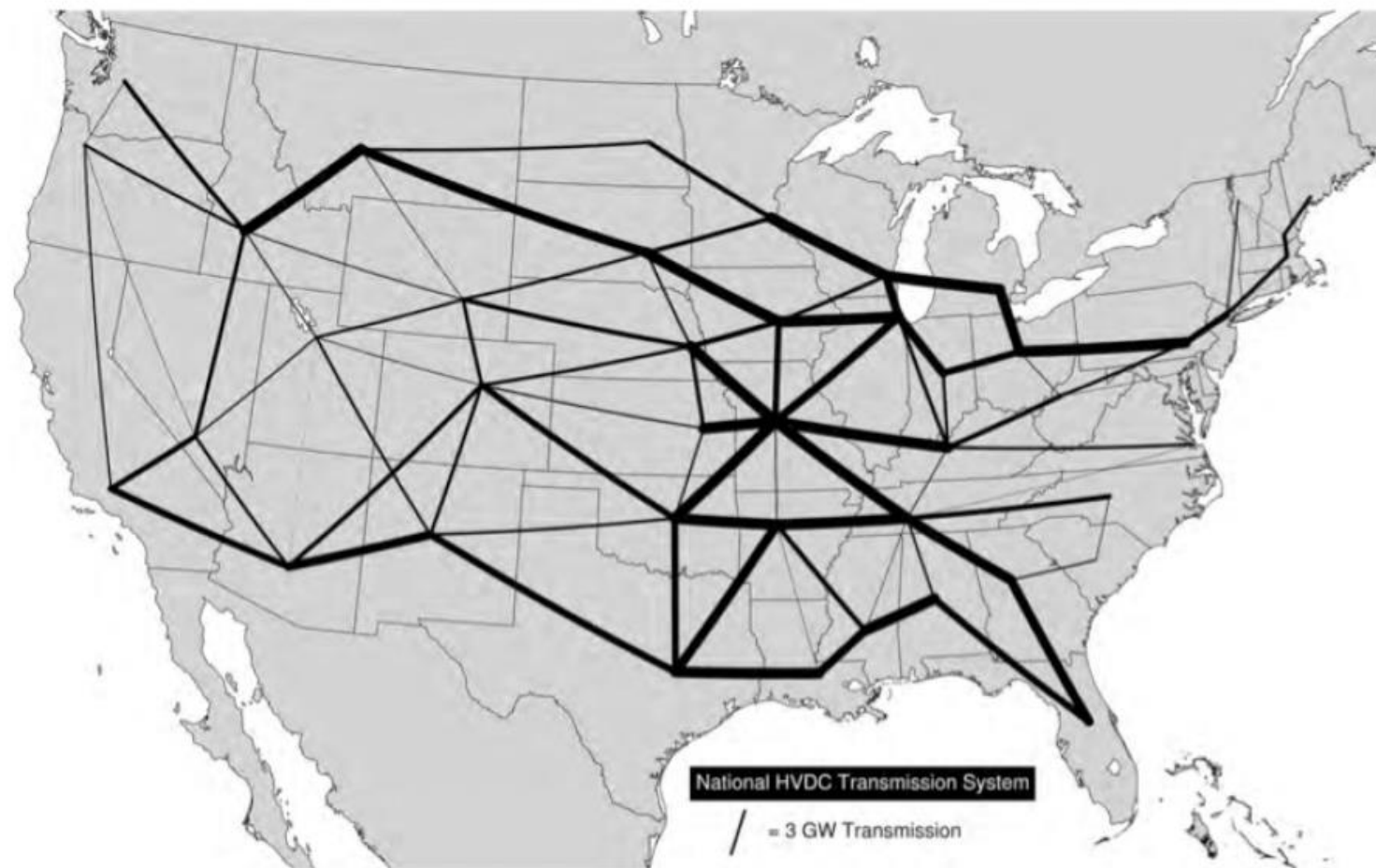
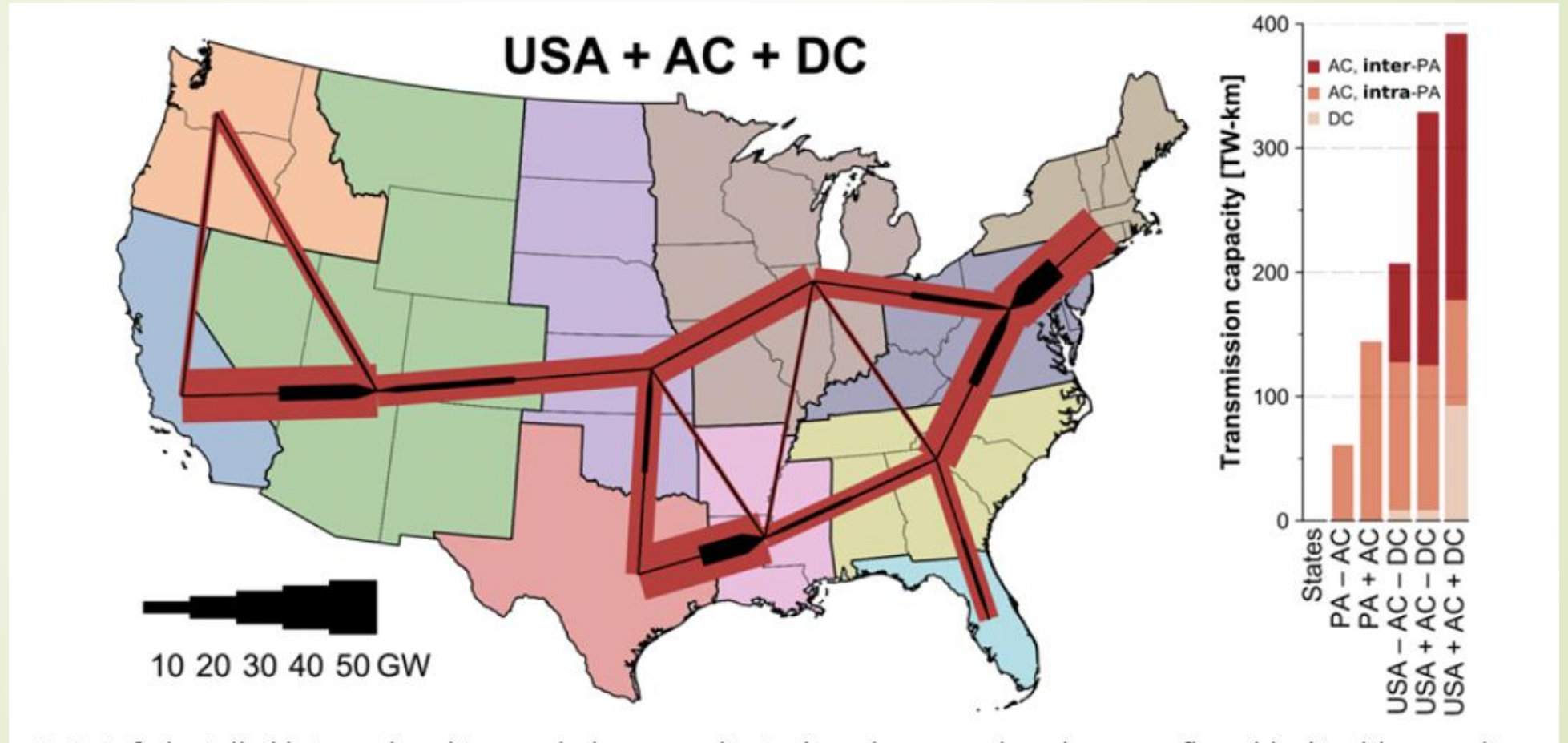


Figure B-5. ZeroByFifty HVDC transmission expansion.

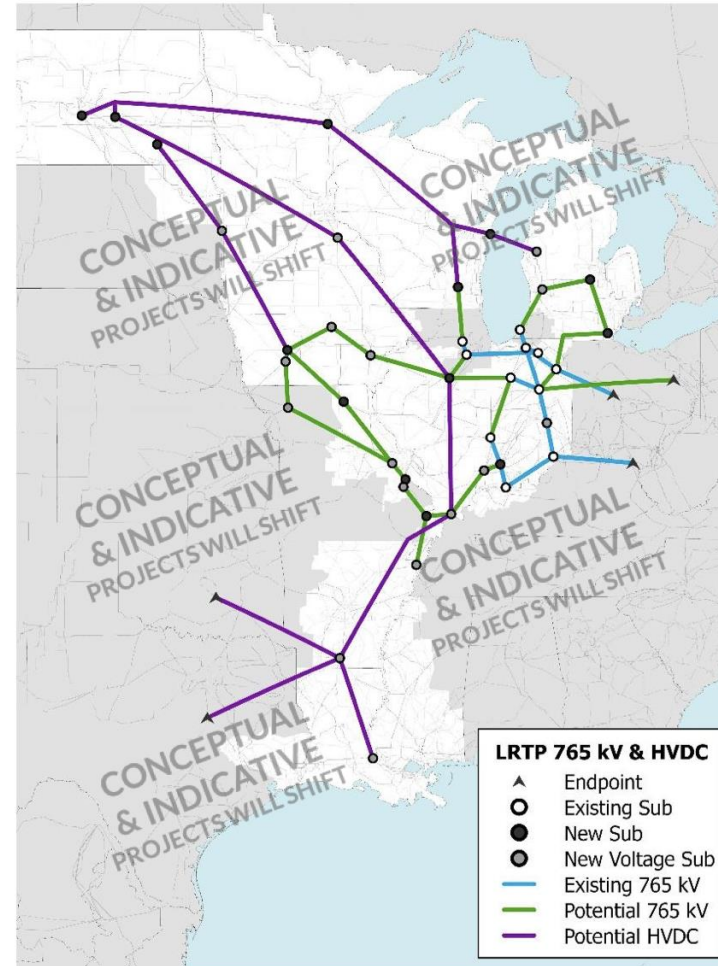
MIT Study



765 kV and HVDC Components of LRTP Indicative Long-term Road Map

Initially Presented in March 2021

HVDC backbone in MISO West and MISO South with connecting HVDC link through Iowa and Illinois



765 kV Backbone in MISO Central and MISO East with heavy ties to PJM West 765 kV

HVDC and 765 kV overlay legacy bulk transmission voltage levels as needed (345 kV in MISO North and 500 kV In MISO South)

CONCEPTUAL ONLY



Enabling Tomorrow's Grid

Electric Infrastructure in the National Interest



1. Need one or more entities that would plan regional, interregional, and cross-interconnection lines that are in the national interest. The decision-makers cannot be captured by market participants and must base their decisions on the national interest.
2. Once lines are planned, those entities need the authority to bind transmission developers to build the lines. This can be done through a competitive process.
3. As to siting the lines, states, localities, tribes and federal agencies with jurisdiction could be provided a set amount of time to work with the developers to identify specific ROWs. Once the ROWs are designed, the chosen developers need eminent domain authority that pre-empts any state or local decisions.



Potential Mechanisms for Implementation

- Congressional action is required.
- Some Options:
 1. RTO's/ISO's:
 - Make participation mandatory nationwide
 - Governance Improvements
 - Firm requirements of interregional planning and development of designed lines
 - Cost allocation would be determined under the RTO/ISO tariff.
 2. New National Transmission Entity
 3. Power Marketing Administrations: expand their scope and expertise; would need to create new federal transmission entities where PMA's are currently not located



THE END

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