



Nuclear Power in the US: Our Opportunity and the Implications

The only way to predict
the future is to create it



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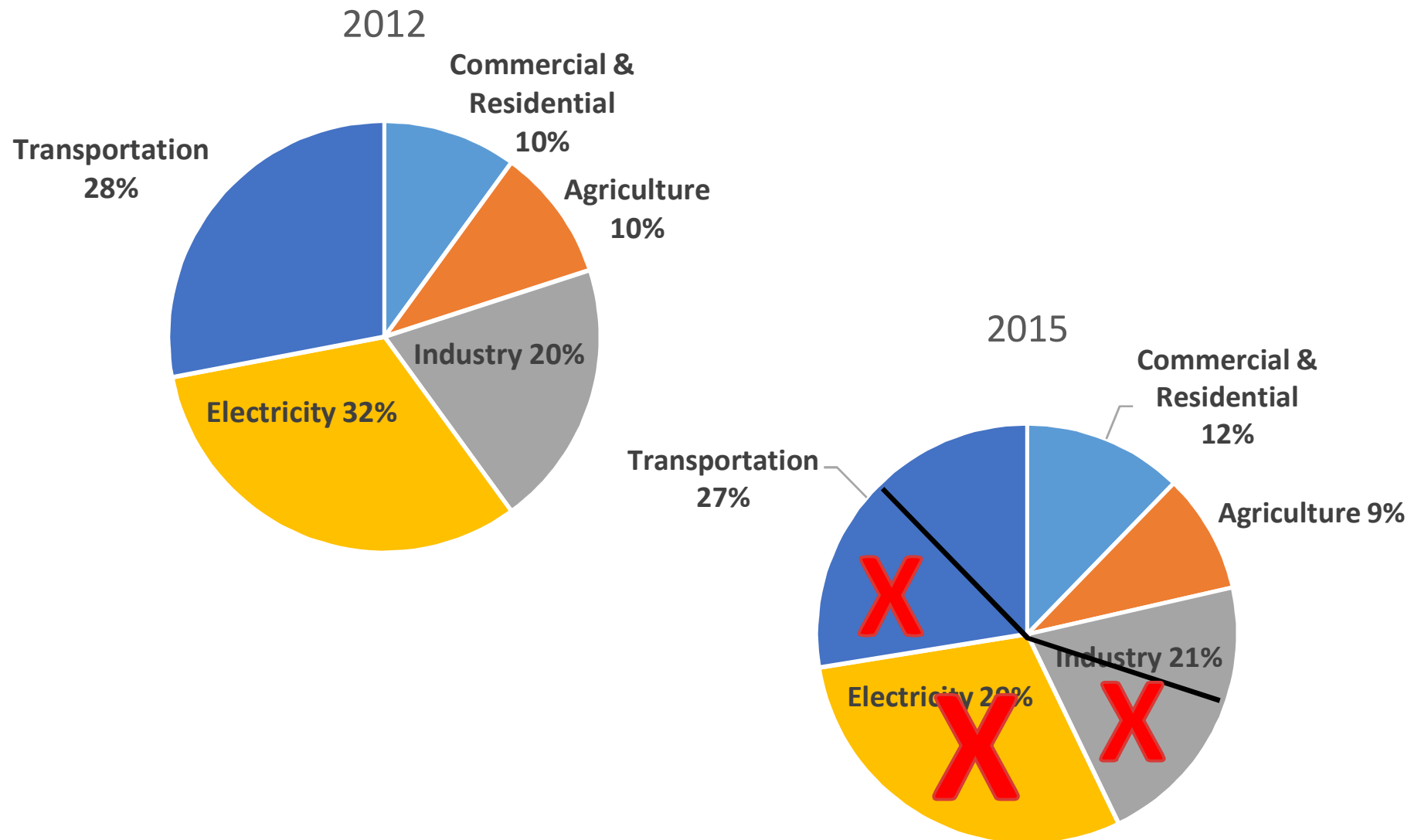
What I Know – Part I

- The world has decided to seek deep decarbonization of energy systems – *and will try hard to achieve that goal!*
- Proper stewardship of our natural resources is ever more critical
- Achieving deep decarbonization will rely on at least one, and likely both of:
 - Increased application of nuclear power
 - Orders of magnitude advancements in energy storage technology

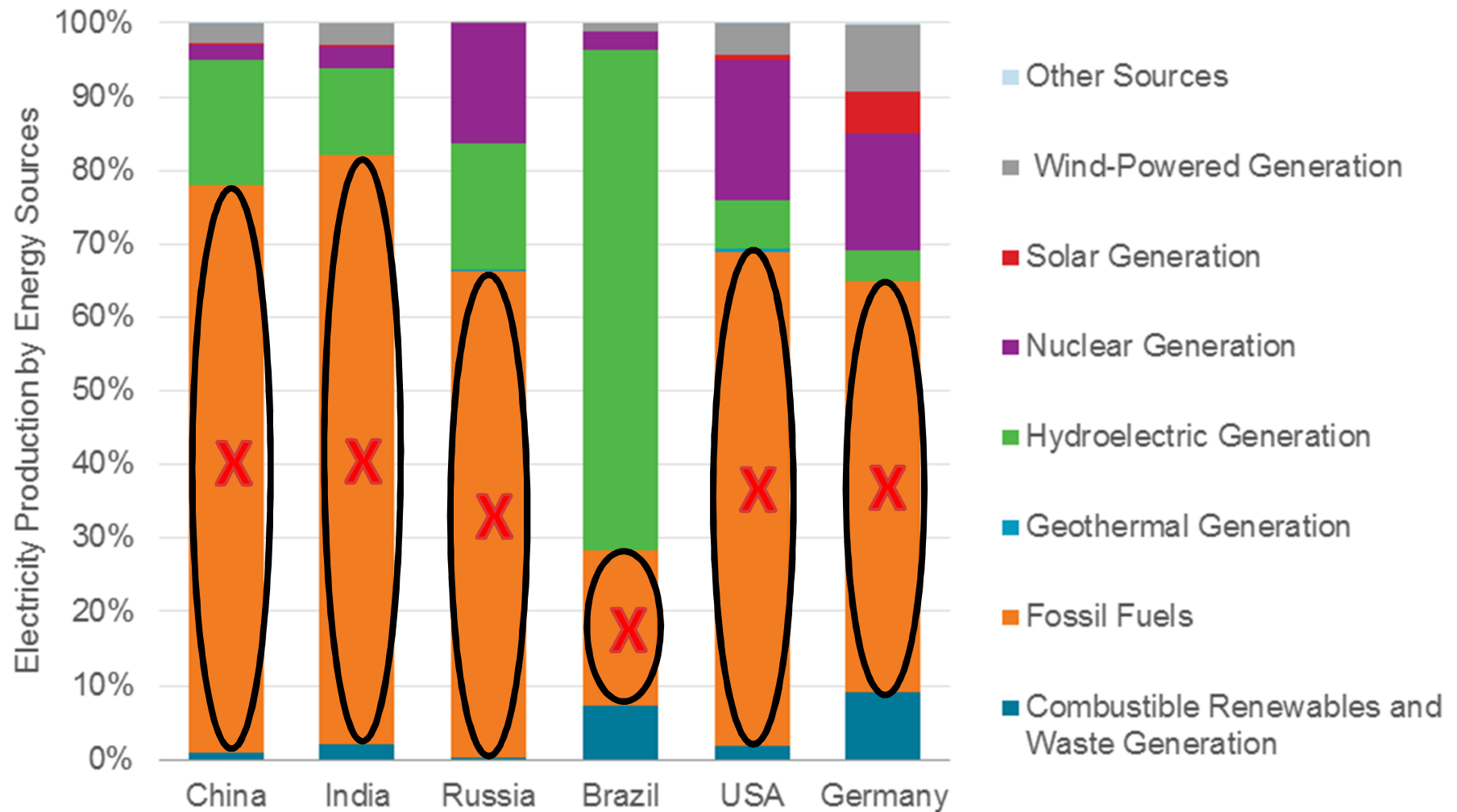


Looking forward at the horizon, there is large potential upside for nuclear power

Sources of Greenhouse Emissions – U.S.



Major Economies – Electricity Production Sources



But the Challenge is Even Greater...



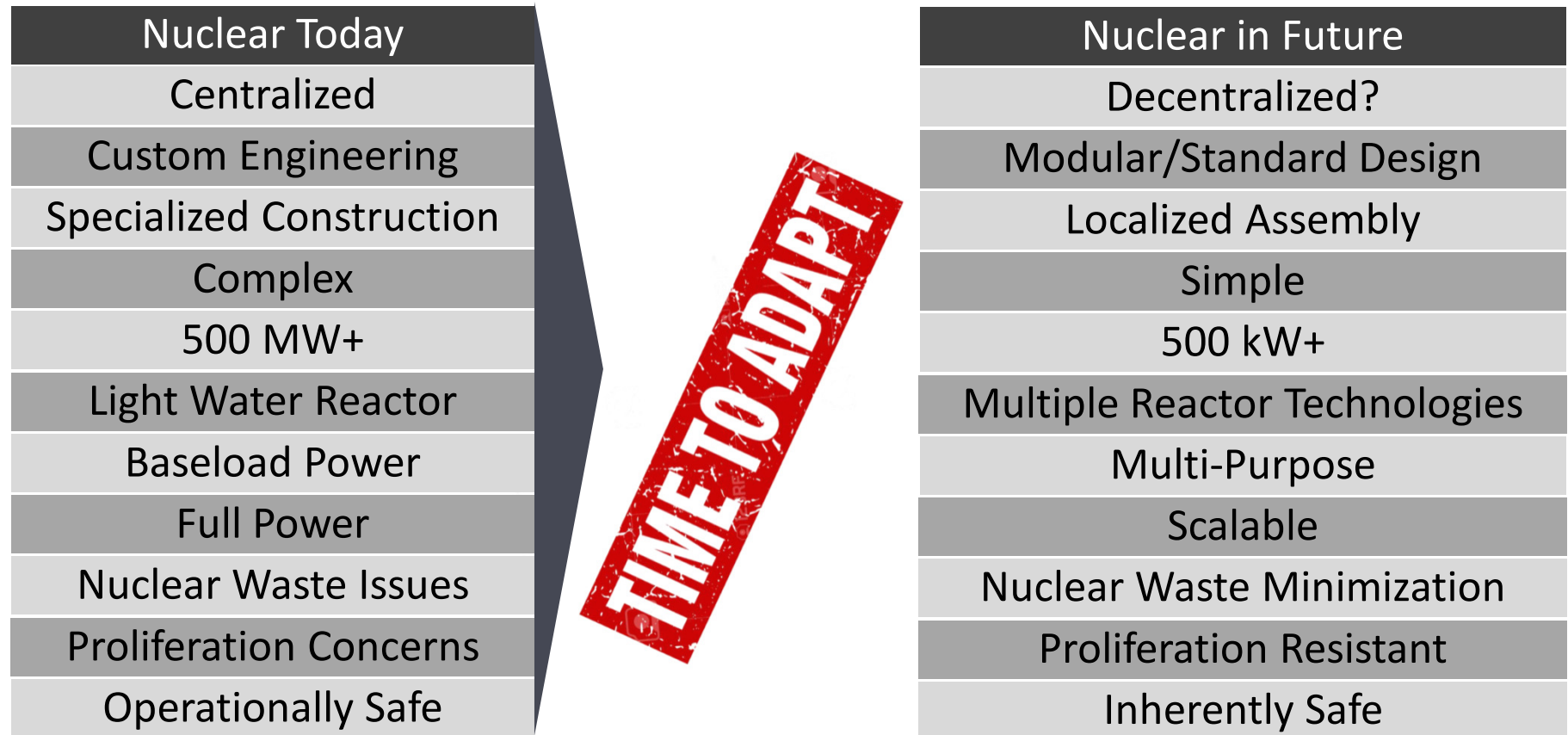
Energy Development Considerations

Nuclear power is the single option that addresses virtually all key considerations

- Diversity of energy sources
- Resiliency of power generation
- Grid stability and reliability
- Environmental and climate impacts
- Energy density, land use
- Local economic development
- Predictability of electricity costs
- National security



Stepping Toward the Future



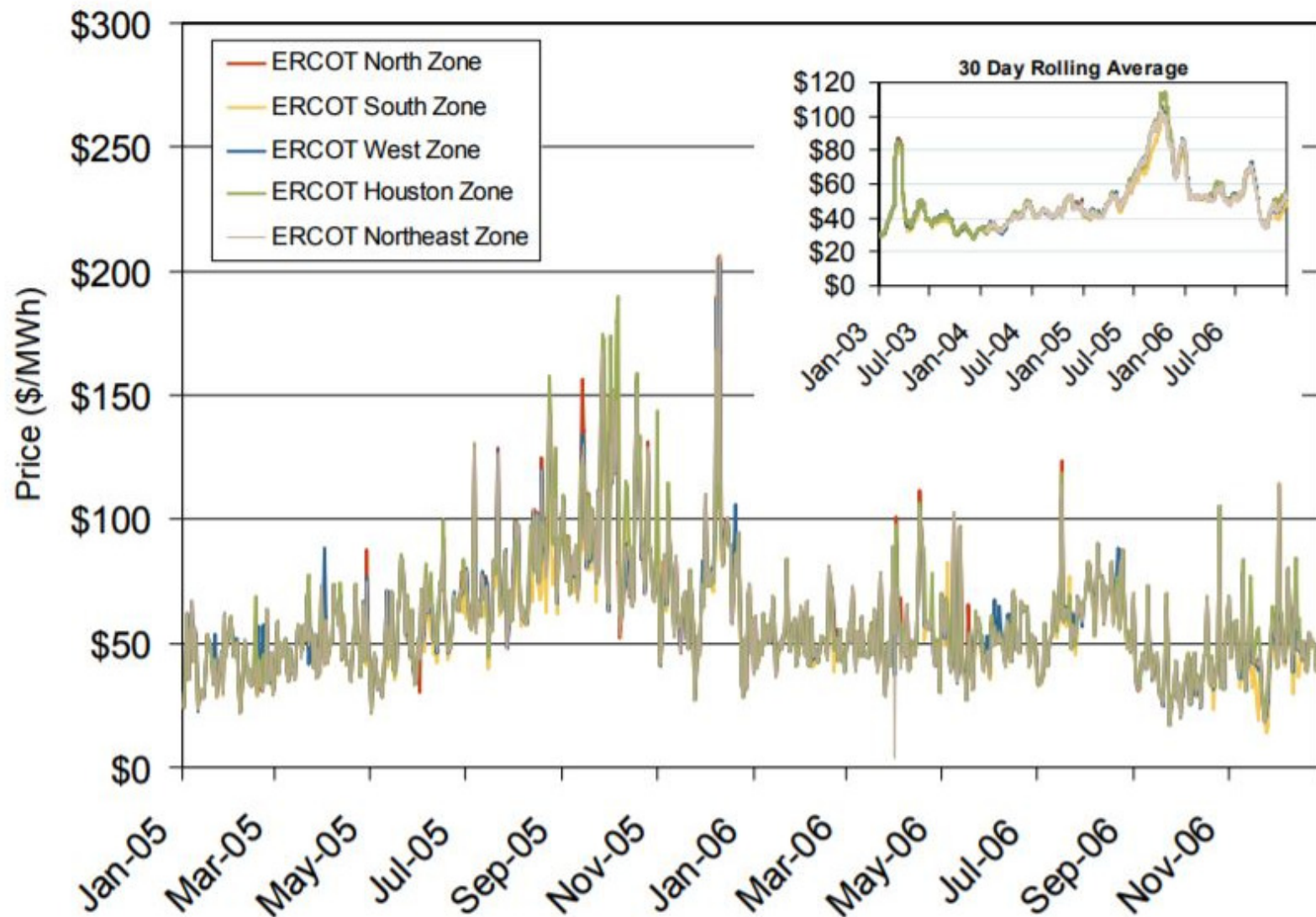
What I Know – Part II

- The “nuclear future” almost certainly looks different than the “nuclear today”
- There is not a “nuclear future” without a “nuclear today”

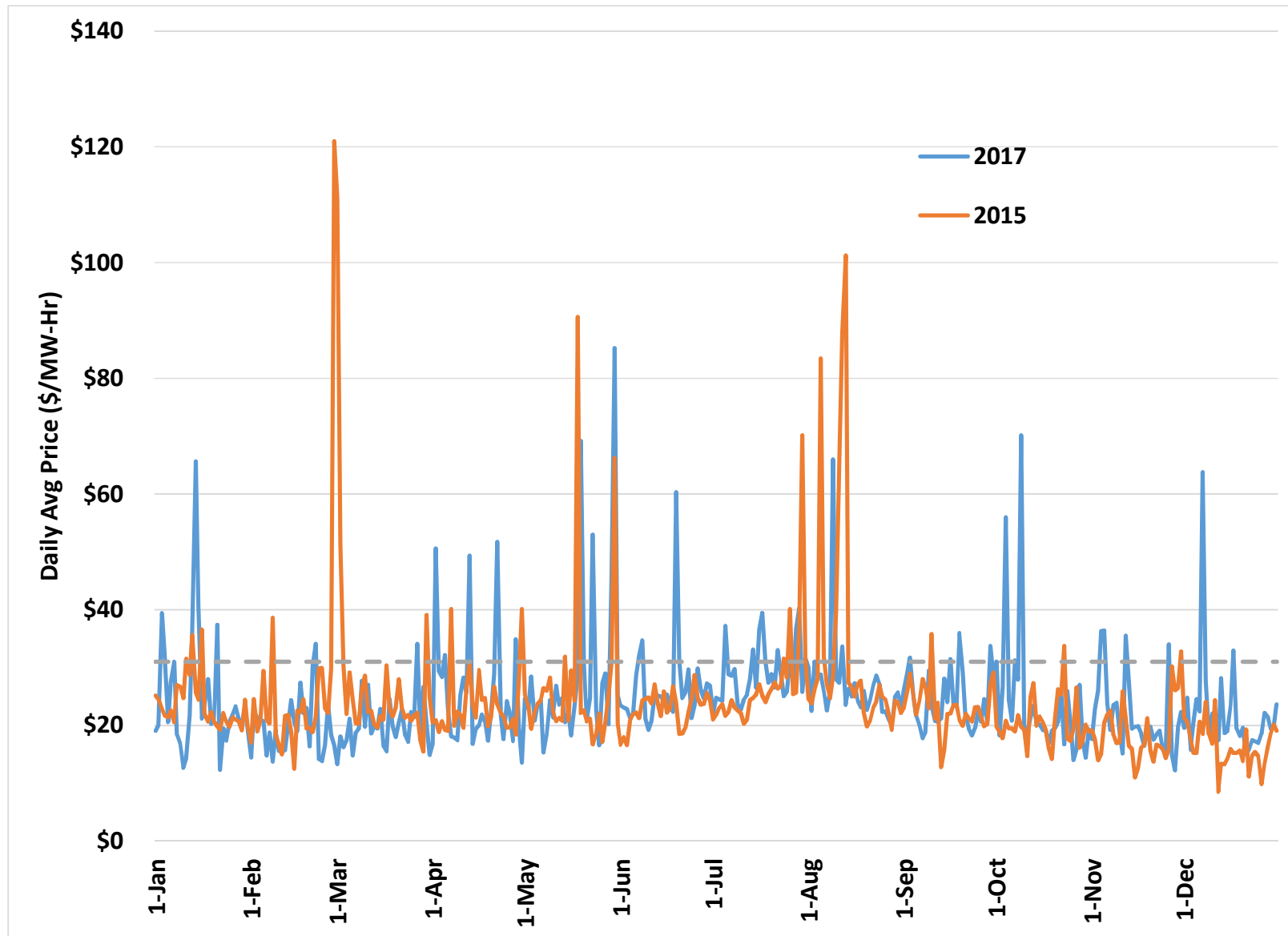


Our potentially bright future exists
**We must understand that capturing
it will require us to be different**

ERCOT 2005-2006

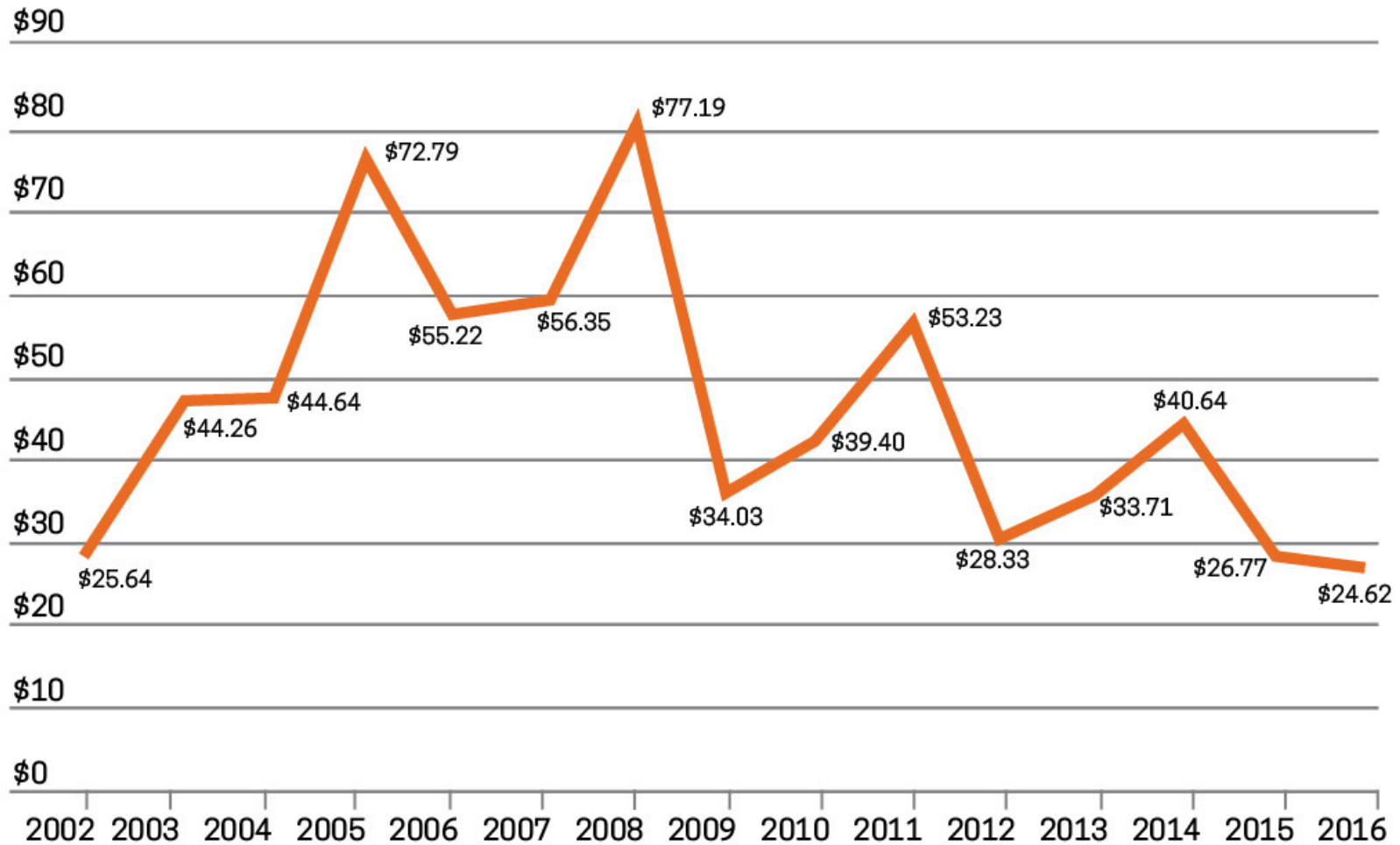


ERCOT 2015-2017



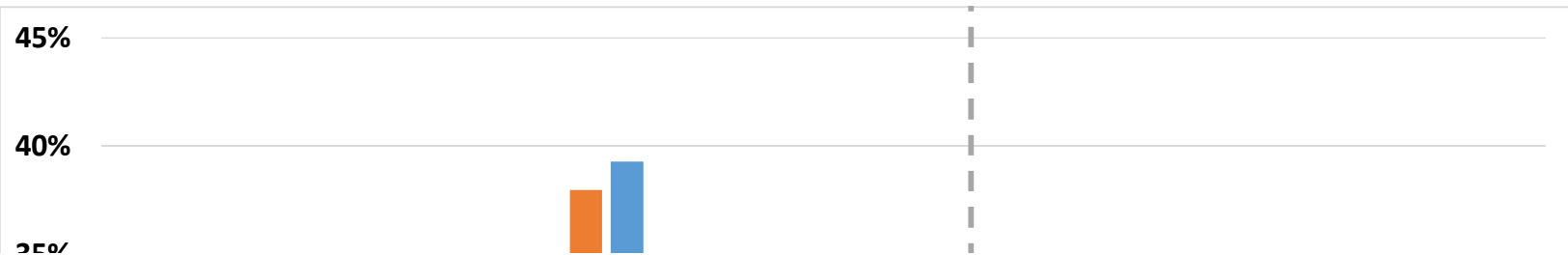
ERCOT Price Trend

LOAD-WEIGHTED AVERAGE REAL-TIME WHOLESALE ENERGY PRICES IN ERCOT 2002 - 2016

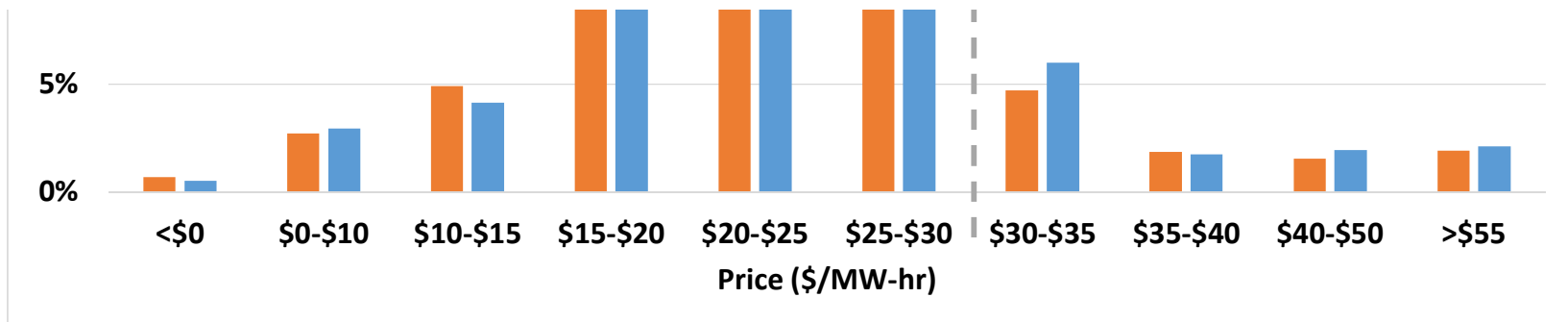


These prices represent load-weighted average settlement point load zone prices, which include 15-minute wholesale energy prices and reflect the effects of transmission congestion in affected load zones.

The Reality of Our World



disruption



What I Know – Part III

- Today is difficult – it can't be sugar-coated
 - We need to work together and get this done
- Tomorrow can be great – as good as today is tough
 - Let's make it even better for all of us
- It might be hard, but we can do this
 - We have the best damn team
 - Society is counting on us
- We have two primary objectives/paths
 - Path 1: Firm our Foundation and Build a Bridge to Future
 - Path 2: Create and Shape our Great Future



Firming the Foundation, Building the Bridge

- Fix dysfunctional energy markets
- Transform NRC culture and processes
- Overcome knowledge transfer challenges
- Aggressively implement key enablers of long life and reduced costs for existing plants
 - 50CFR50.69 and broad risk-informed regulation (including security)
 - Accident tolerant fuel
 - Digital I&C
- Advance SMR programs through broad implementation



Shaping and Creating the Nuclear Future

- Shift development culture from “safest and niftiest” to “most attractive to customers (and very safe)”
- Shift culture around advanced reactors from R&D to implementation
- Establish needed codes, standards, and regulations
- Empower and enable the next generation of industry leaders
- Solve financing challenges, enable early and sustained investment



Get prepared now – adapt and evolve!
We must be ready when the opportunity presents itself

Back to why we are all here...

Thoughts for Regulators

1. Remember – the objective is safety and high quality, not reams of paper nor strict procedure adherence that distracts from quality
2. Expect licensees and suppliers to perform – hold them accountable – but with a focus on items and areas of significance
 - Embracing risk informed decision making will lead to greater plant safety by directing attention and focus to what is truly important
3. Respect the “current licensing basis”, when you do everyone is on same page and performs better
4. Recognize that inaction is a decision that can affect safety, particularly ability to capture additional safety benefits

Keep your eyes on the big picture and key objectives,
don't allow yourselves to be distracted by the unimportant

Thoughts for Utilities

1. Focus on enabling suppliers to deliver value and make a difference for you; avoid a focus on cutting costs (and corners)
2. Understand and embrace that arguably the primary factor defining supplier performance is your performance as a customer
 - Proper involvement through the process to avoid scope creep and ensure supplier hits the mark
 - Discipline in long range planning to reduce costs and improve quality
3. Remember, more paper and more onerous T&Cs doesn't ensure high quality – keep an eye on the prize
4. Yes, hold suppliers accountable, and also give them the chance to learn, improve, and impress you

Remember, your suppliers are hostages with you,
you should desire for your suppliers to be profitable

Thoughts for Suppliers

1. Our customers simply can't continue spending more – either they become more efficient or they dissolve
 - We need to help them be successful!
2. A “new normal” is being defined – we can't stop it, our opportunity is to help shape it
3. There is plenty of opportunity to provide products and services to US nuclear industry..., as long as the supplier:
 - Delivers value to customer
 - Meets their commitments (schedule and cost)
 - Has high quality
 - “Owns” their performance
4. Our future is screaming for supplier led innovation – embrace it, deliver it, make a difference

We need to (and can) earn our success, it won't be handed to us
We have the opportunity to influence shared success

Why is This So Damn Important?

- Nuclear power plants provide important benefits and address equally important national challenges:
 - Economic engines
 - Climate/environment
 - Energy independence
 - Diversity of energy resources
 - Stability and reliability of the grid
 - Predictability of electricity costs
 - National Security
- As leaders in industry and our communities, we have the obligation to make investment decisions for the best overall approach for long term energy, economic, and environment stewardship



We need to create the future for nuclear power
We need to be successful!