

Energy transition An opportunity to forge a new legacy



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50+ years in the energy business

Over 1,100 energy experts across North America, UK, India, China, and Ghana

200+ energy efficiency programs and **\$3.1B** in energy efficiency rebates

Top 60 utilities in North America

Best-in-class implementation for **30+ utility portfolios**, more than any other provider in the U.S.

Supports **all major energy NGOs, federal agencies, and state DOEs** on energy issues

Largest implementer of electrification programs in the U.S





Decarbonization

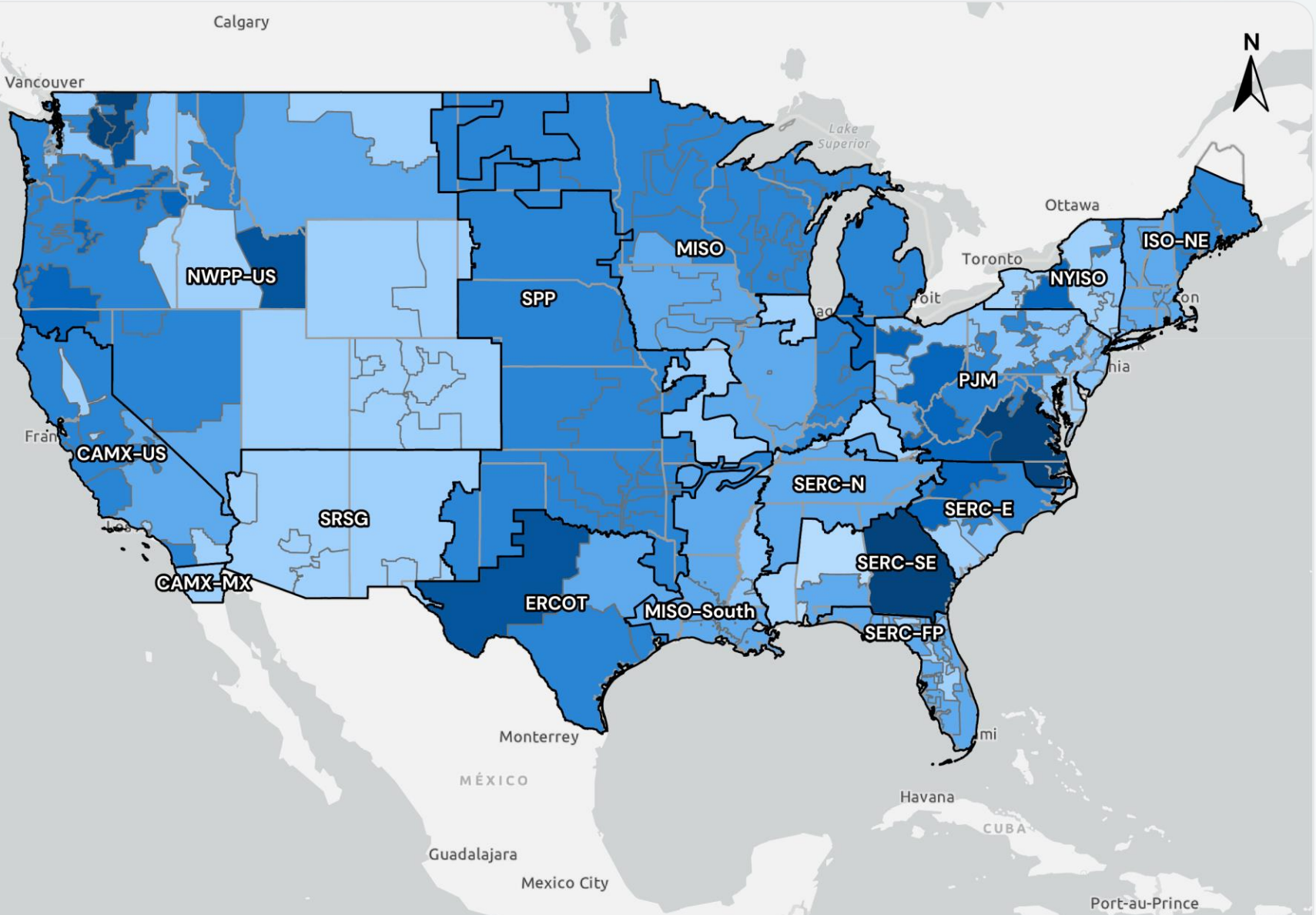
Electricity
demand

Reliability

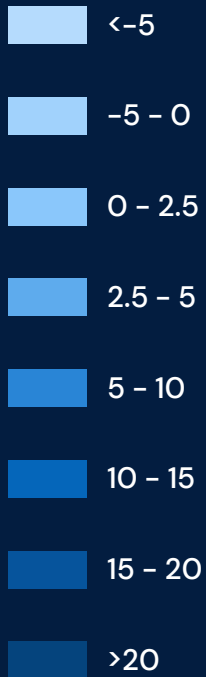
Resilience

Affordability

US energy peak demand growth



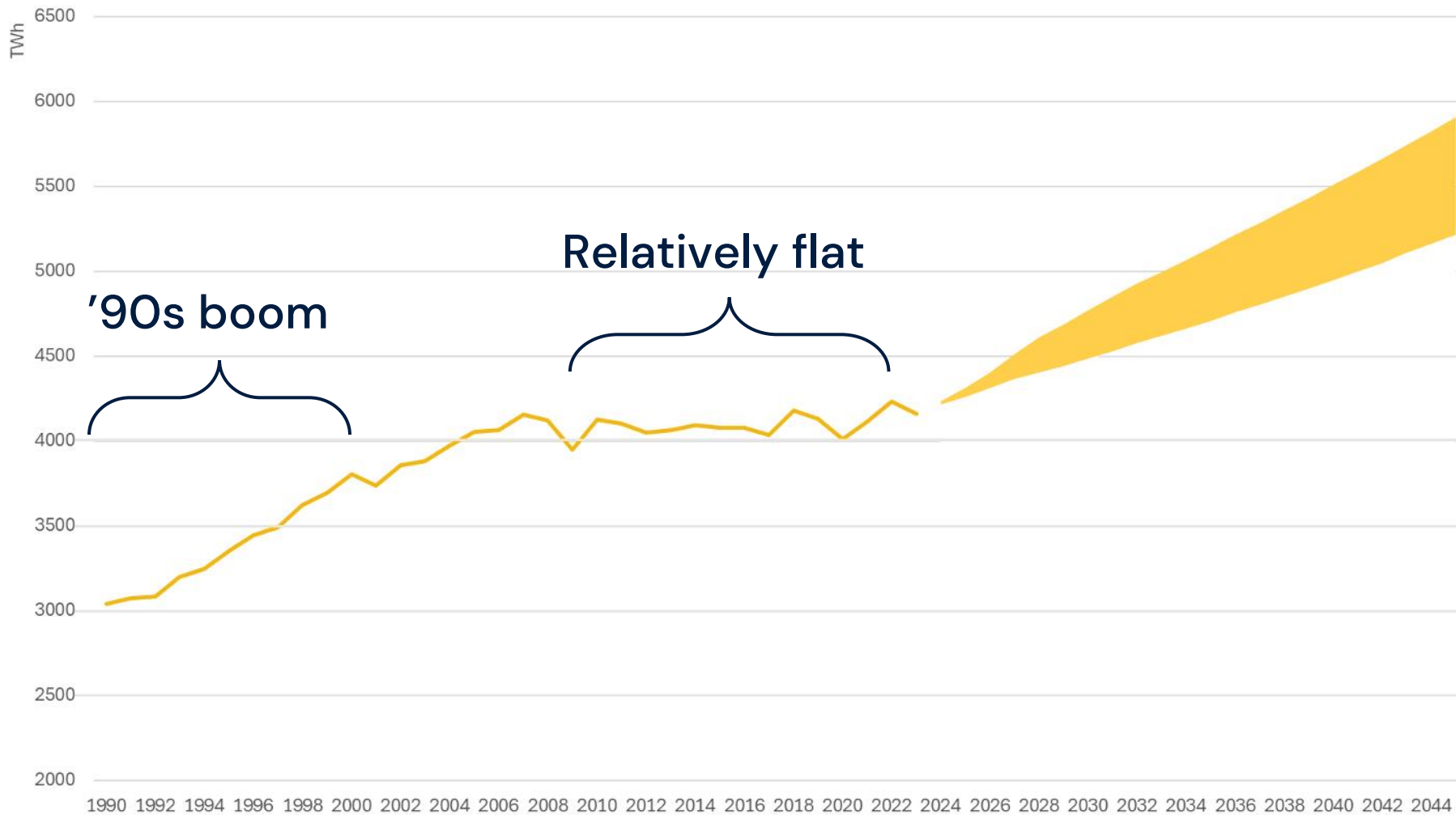
% Growth (2024-2028)



Data source: ICF



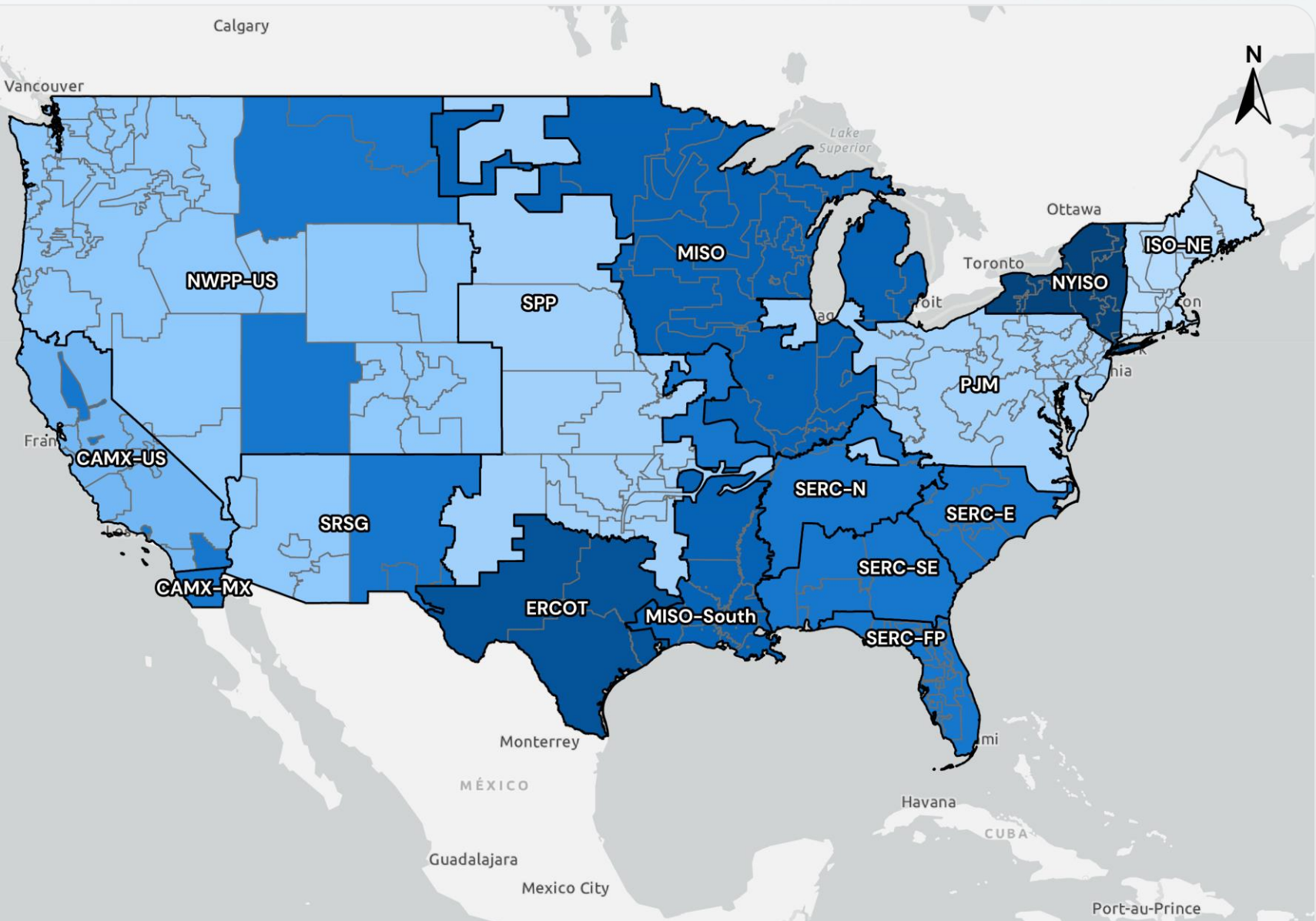
US electricity demand growth is expected to surge



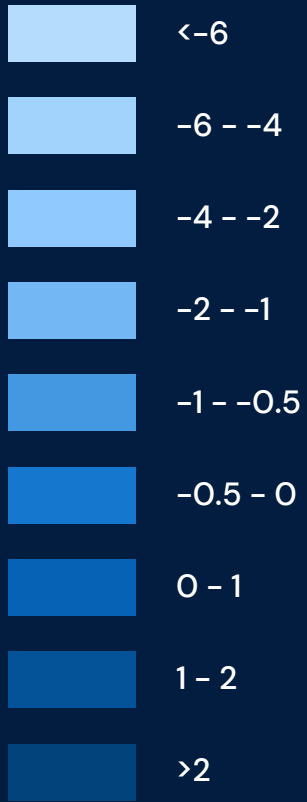
- Year-on-year expectations increase 13%
- Growth rate equivalent to '90s boom

Data source: ICF

U.S. projected regional reserve margins trends



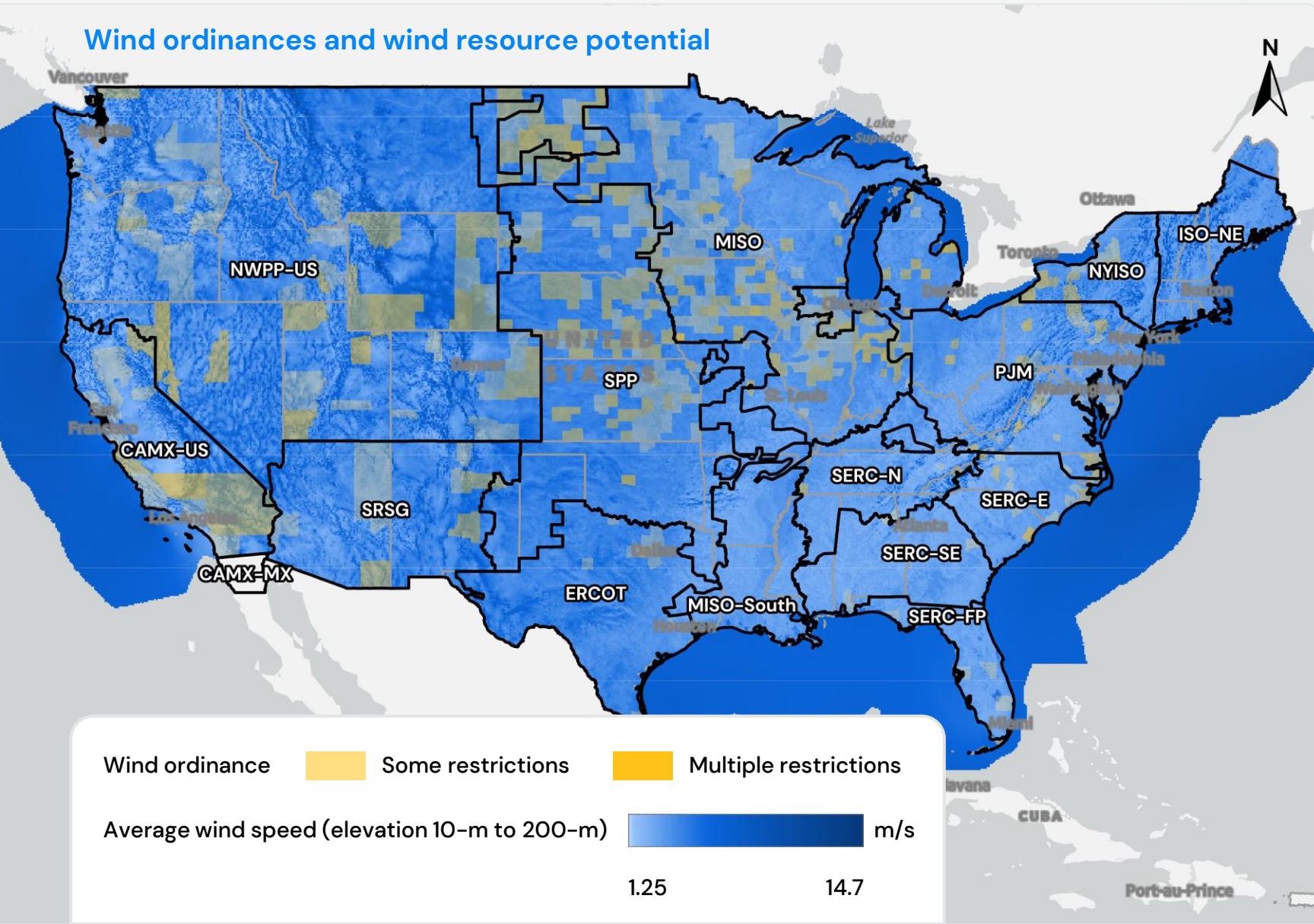
Change in reserve margin (percentage point difference)



Data source: ICF



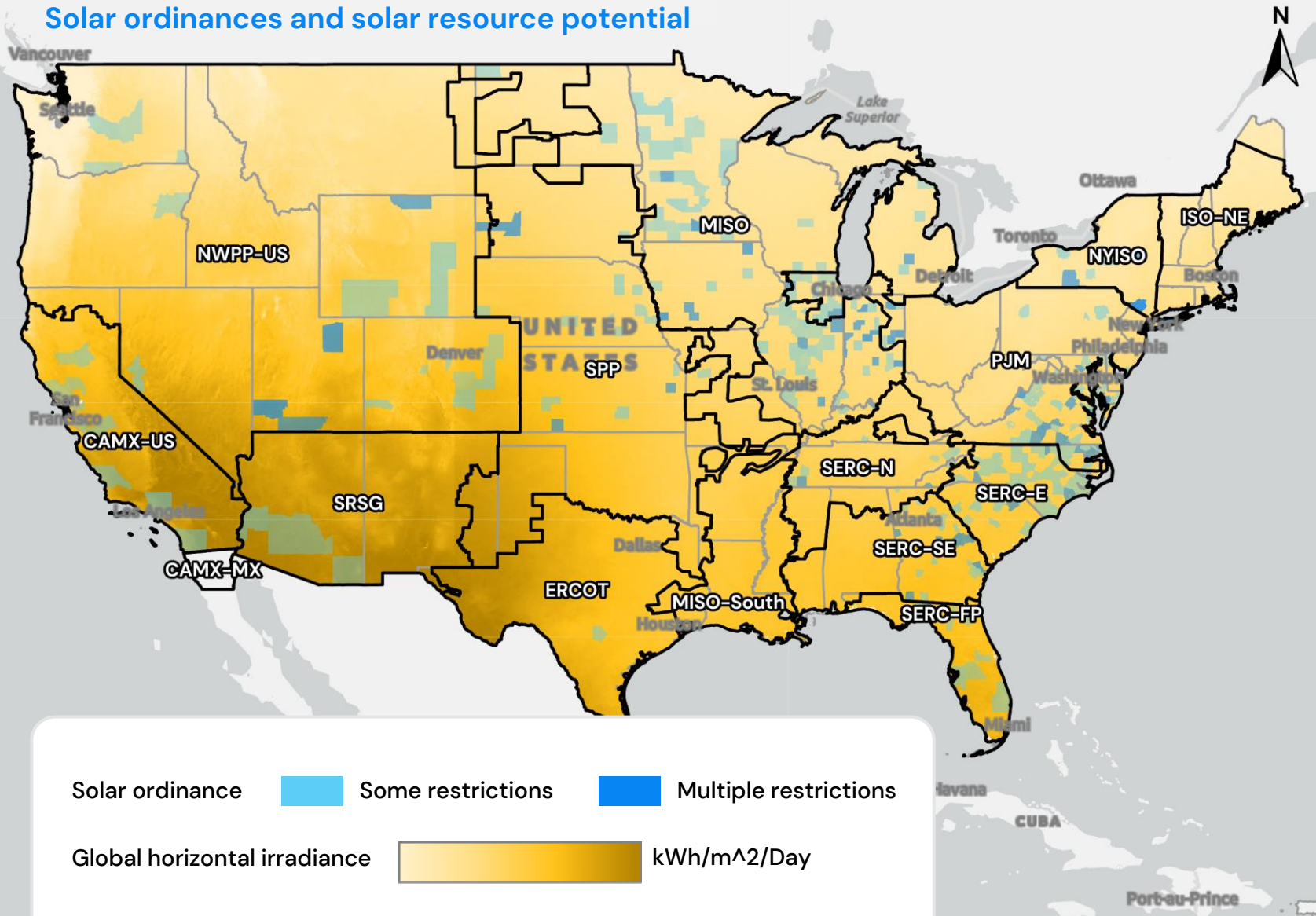
Local restrictions **constrain** use of renewables (**wind**)



- Geographic differences
- Slow Interconnection approvals
- Citizen objections

Compiled by ICF using NREL datasets

Local restrictions **constrain** use of renewables (**solar**)



- Geographic differences
- Slow Interconnection approvals
- Citizen objections

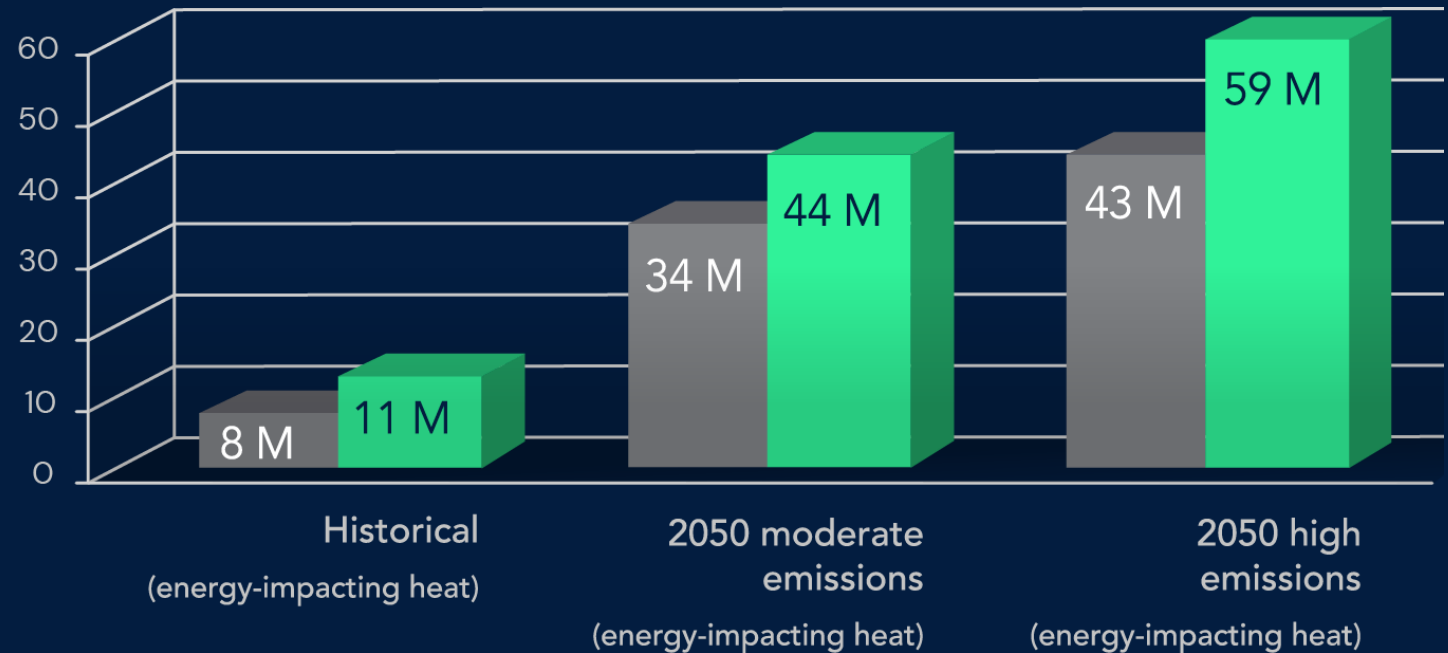
Compiled by ICF using NREL datasets

Energy-impacting extreme heat exposure across U.S.

U.S. population exposed to energy-impacting heat

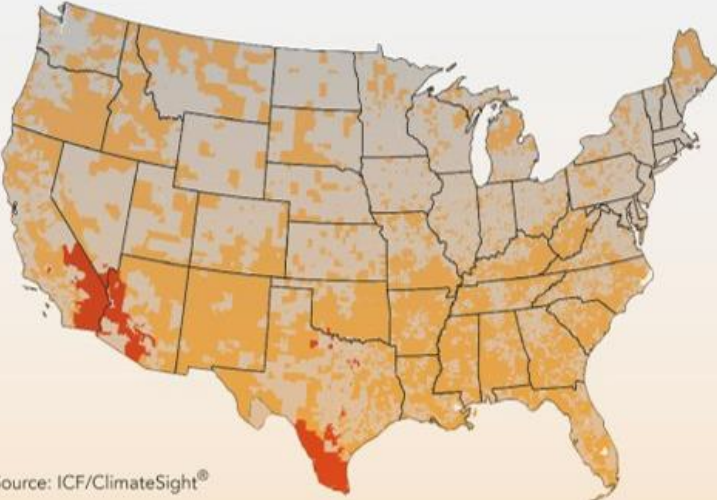
By 2050, **34 million additional people** in Justice40 communities could face energy-impacting heat each year in a moderate emissions scenario.

In a high emissions scenario, the number grows to **44 million people**.

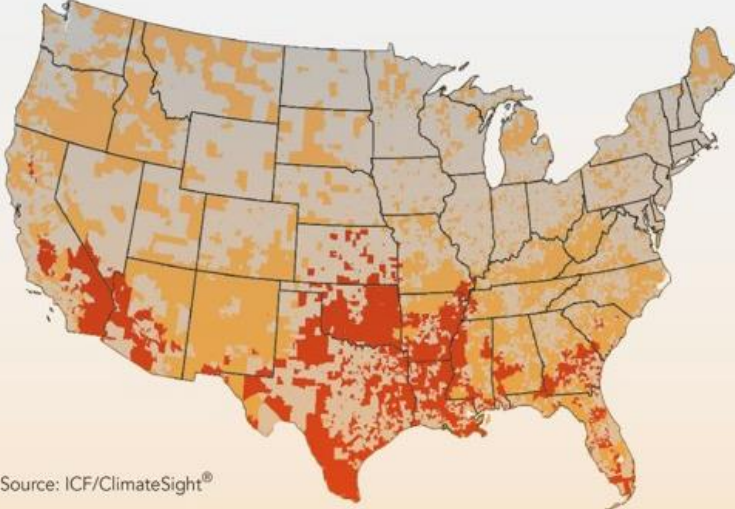


Energy-impacting extreme heat exposure across U.S.

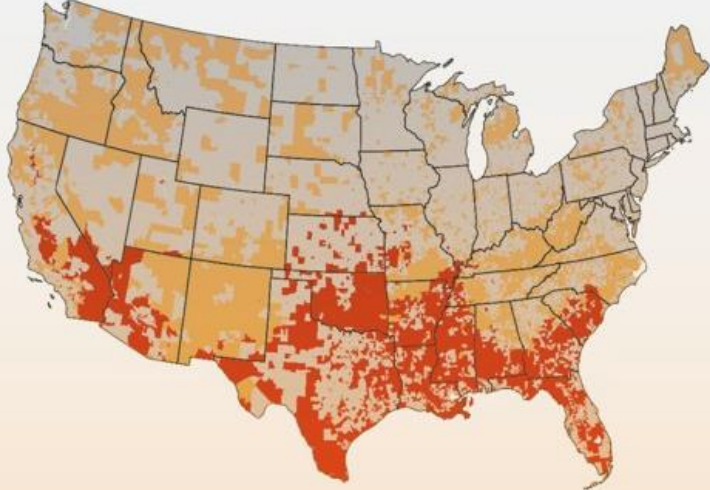
Historical



2050 moderate emissions scenario (SSP2-4.5)



2050 high emissions scenario (SSP5-8.5)



Not Justice40 communities

Justice40 communities not exposed

Justice40 communities exposed

Key recommendations for utilities

1

Create more sophisticated and integrated system planning

2

Identify ideal locations for renewable energy projects

3

Evolve the distribution grid

4

Plan and implement next-gen customer programs

5

Leverage data and artificial intelligence

6

Engage with regulators

ICF energy customer insights

Who we surveyed

Residential customers across U.S. (homeowners and renters)

10k

Surveys completed

5

Regional level areas of data

~2k

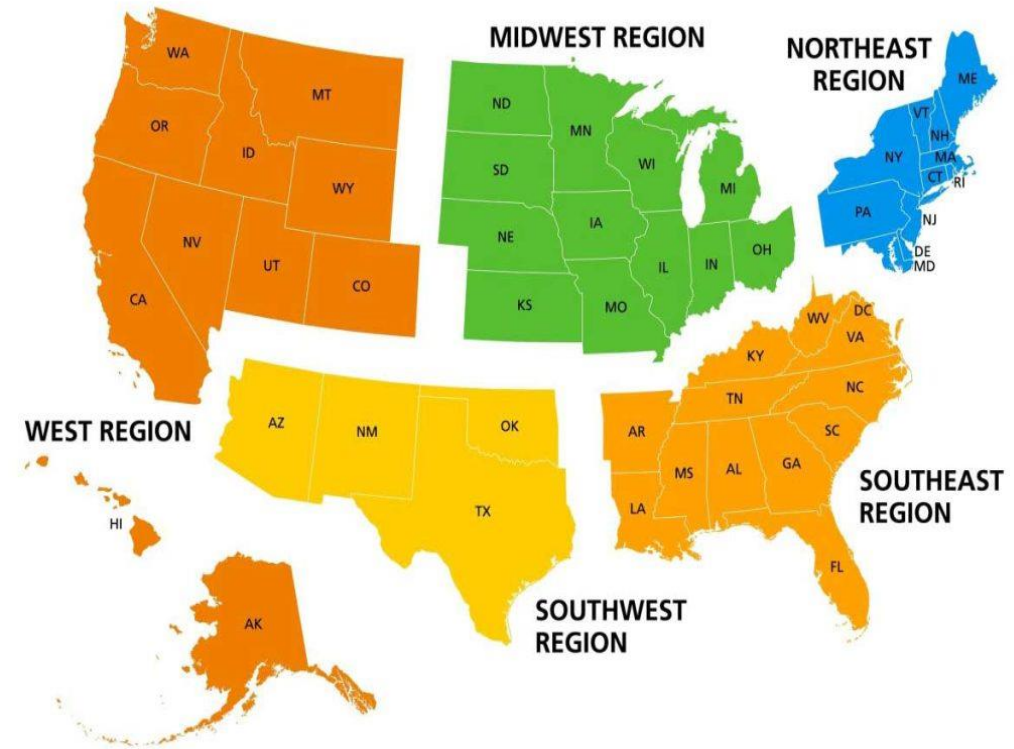
Completed surveys per region

A key insight among many

59%

of energy customers are comfortable with their utility provider managing their home energy use

Data source: ICF



Evolution of demand-side customer programs

Decarb Focus

Stemming from state climate goals.

GHG metrics.

Energy efficiency still a key focus area in the future.

Electrification

Utilities launching BE programs in support of broader climate goals.

Electrification of buildings, industry, and transportation.

Examples: New York Clean Heat, New Jersey, Maryland

DERS and VPPs

Management of loads becomes critical:

- Demand growth – see recent ICF Report
- Intermittent renewables

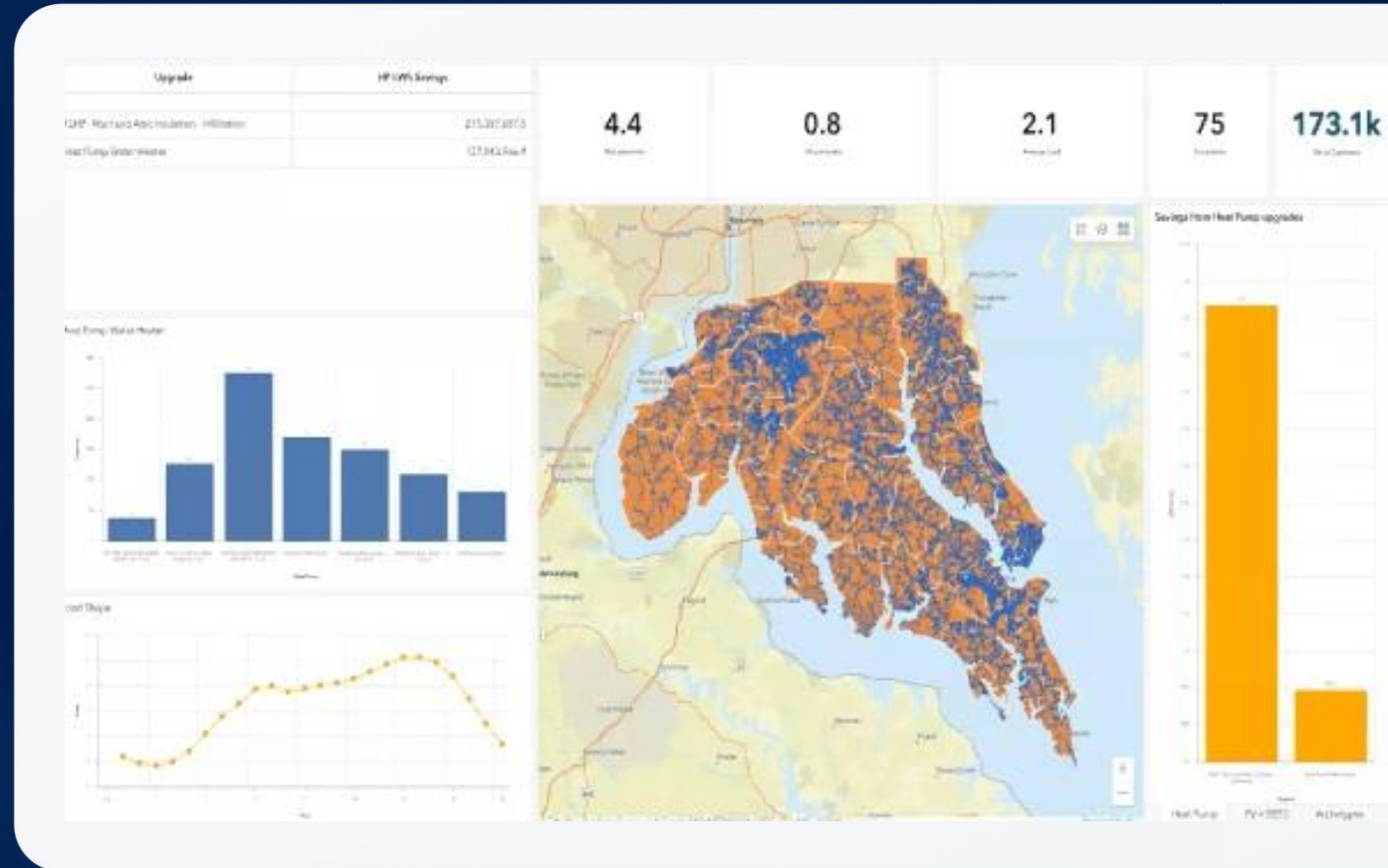
Smaller DERs on the grid can be orchestrated to become a large grid resource.

Customer engagement and education will remain a critical factor in the ability of utilities to remain as a trusted entity to customers through the energy transition.

Demand response revolution

Granularity and locationality:

- Identify grid constraints
- Forecast load at the premise level
- Aggregate load forecasting across system
- Forecast DER adoption
- Simulate DER adoption's load impact
- Assess flexible load management options through customer programs



SMECO's next-gen utility program

Problem

- Reduce during times of high energy use

Solution

- Apply data analytics/machine learning (who/when)
- Control member thermostats with **customized adjustments** during high energy demand

Results

- 2.7 to 4% more energy savings than a traditional DR program
- Maintain or increase customer comfort & satisfaction
- Decrease less efficient and more expensive power sources
- Lowers costs for all co-op members



A photograph of a family of four—a woman with curly hair, a man, and two children—gathered around a laptop. They are all smiling and looking at the screen, suggesting a collaborative and positive environment. The image is dimmed to serve as a background for the text.

Forging a
new legacy

Opportunities

Challenges

ICF Flagship Report Links

- Extreme Heat / Disadvantaged Communities
 - [How to Protect Disadvantaged Communities in the U.S. from Extreme Heat? 5 Approaches | ICF](#)
- Power Surge / Demand Growth
 - [The impact of rapid demand growth: Affordable, clean energy under threat | ICF](#)