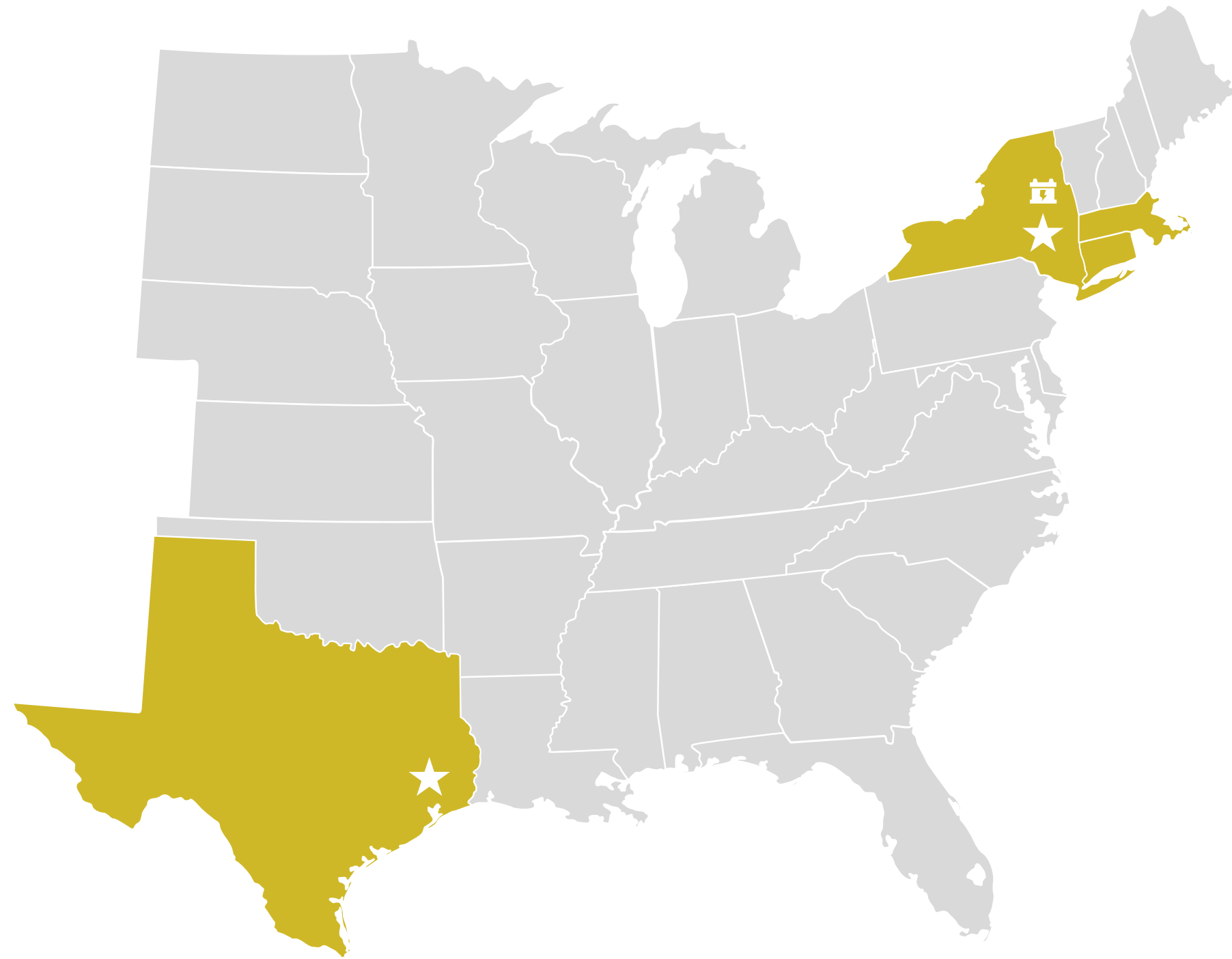


# NECPUC – Utility-Scale Storage

# KCE has active development in 3 RTOs/ISOs

Since 2016, KCE has been developing stand-alone energy storage



 In Service

 KCE Office

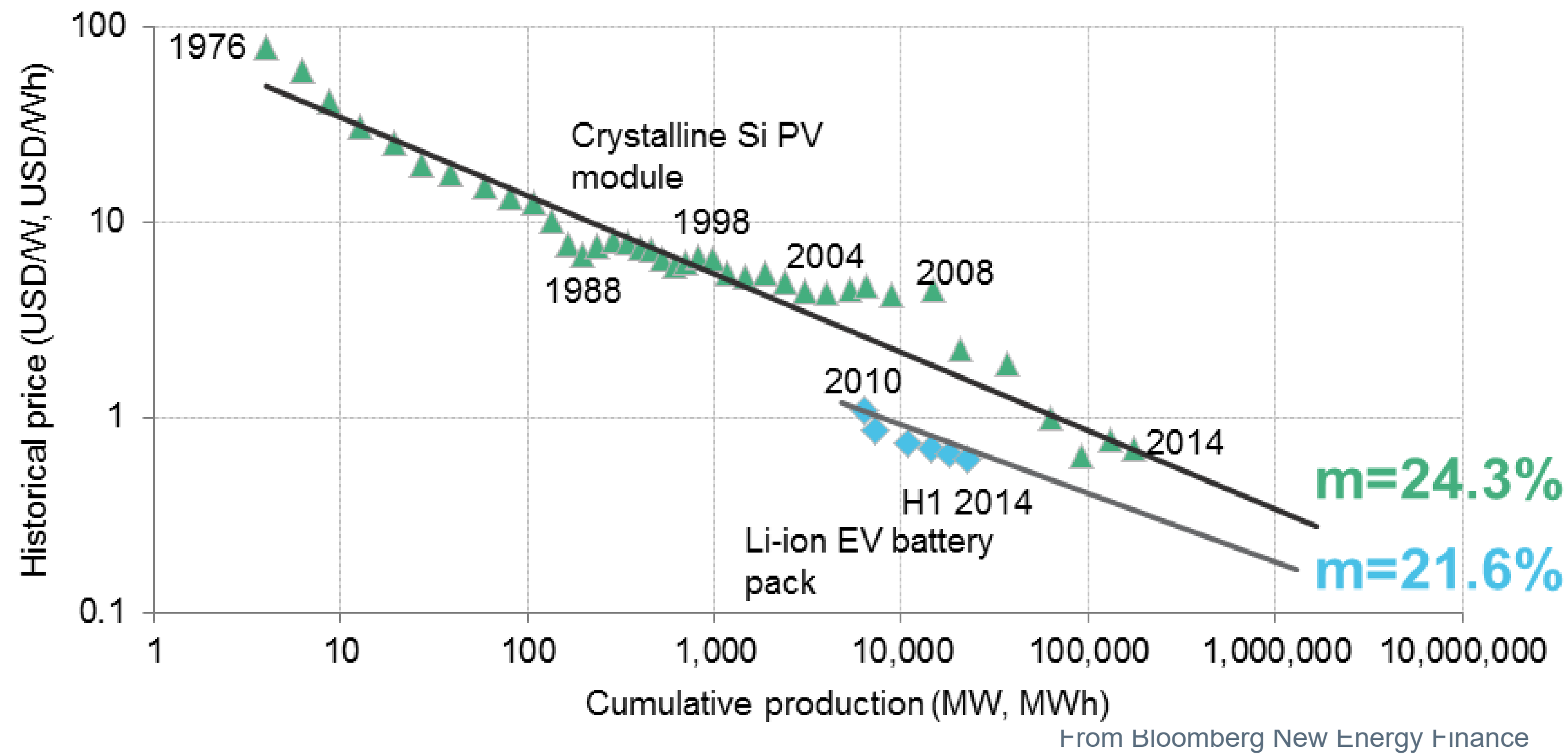
ISO	Status	MW	Earliest Online
NYISO	In-Service	20	
	Awarded	3	1Q 20
	Development	320 +	2019-2021
ISO-NE	Development	Not public	1Q 20
ERCOT	Development	Not public	Summer 2019

KCE is headquartered in Albany, NY, with offices in Houston TX and Salt Lake City, UT. KCE brings market/regulatory knowledge, storage development, procurement and asset optimization experience and expertise.

# Batteries .... they're coming

Electric Vehicles are driving down the battery cost curve

**LITHIUM-ION EV BATTERY EXPERIENCE CURVE COMPARED WITH SOLAR PV EXPERIENCE CURVE** Bloomberg  
NEW ENERGY FINANCE



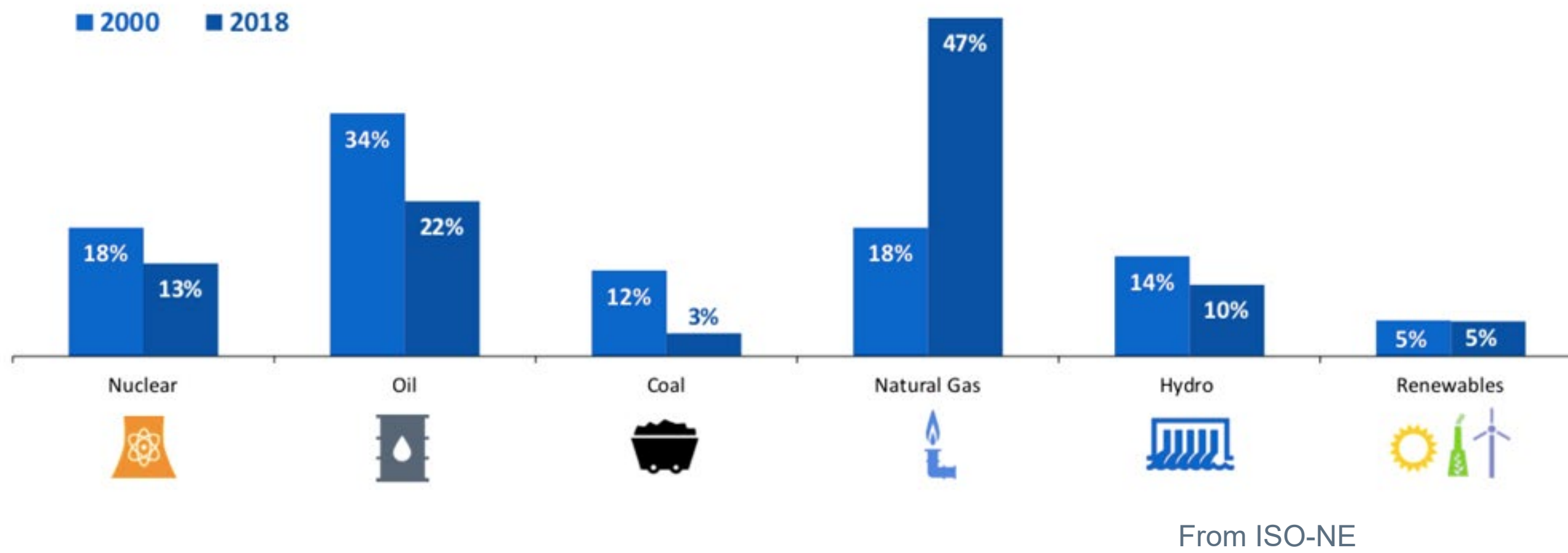
To drive solar down the experience curve, we needed Germany, Spain, Ontario, New Jersey, etc. to create the industry.

Correctly valuing batteries benefits will lead to widespread grid use.

# Why will New England be a leader?

The ISO-NE energy mix is rapidly changing. Storage will be a large component.

Percent of Total System **Capacity** by Fuel Type  
(2000 vs. 2018)



## KCE is in New England because....

- No new natural gas pipelines will be constructed again in New England
- The Duck Curve is not coming .... The duck curve is already here
- Storage has the rapid response capabilities and two-way flexibility as a key balancing resource
- If the wholesale market is not correctly pricing attributes that states want, state legislators have proven they will solve the problem

The grid has proved resilient over ten years in spite of ISO concerns on intermittent renewables' variability and lack of natural gas pipelines.

But we only need to be collectively wrong once.

# What are the barriers to entry?

The ISO-NE energy mix is rapidly changing

## ISO-NE Challenges (i.e. how to keep the lights on)

- Continued winter reliability risk as grid migrates from on-site fuel to fuel-on-demand
- GHG emission constraints limit individual generator production
- Inability to get real-time data from 10,000 different ISO-NE distributed solar sites
- Electrification of the transportation sector and space heating leading to a reversal of recent trends and anticipated growth in market

## Energy Storage Challenges (i.e. Barriers to Entry)

- ***What is a state wanting from energy storage that the wholesale market isn't compensating?***
- Rules for wholesale market continue to evolve, often in reaction and not in anticipation
- Storage benefits not priced into market (GHG emission reductions, reduced fossil ramping, deferring transmission/distribution investments, increasing grid flexibility & resiliency, etc.)
- Ireland has 14 types of ancillary services; ISO-NE has 5
- State support for “missing money” is still being defined (Clean Peak Standards vs. Non-Wires-Alternatives vs. Storage Adders for Renewables, etc.)

**Can we solve these barriers to entry using the wholesale market?**

**Else, what are the right state support mechanisms that should go in place for consumer benefit?**