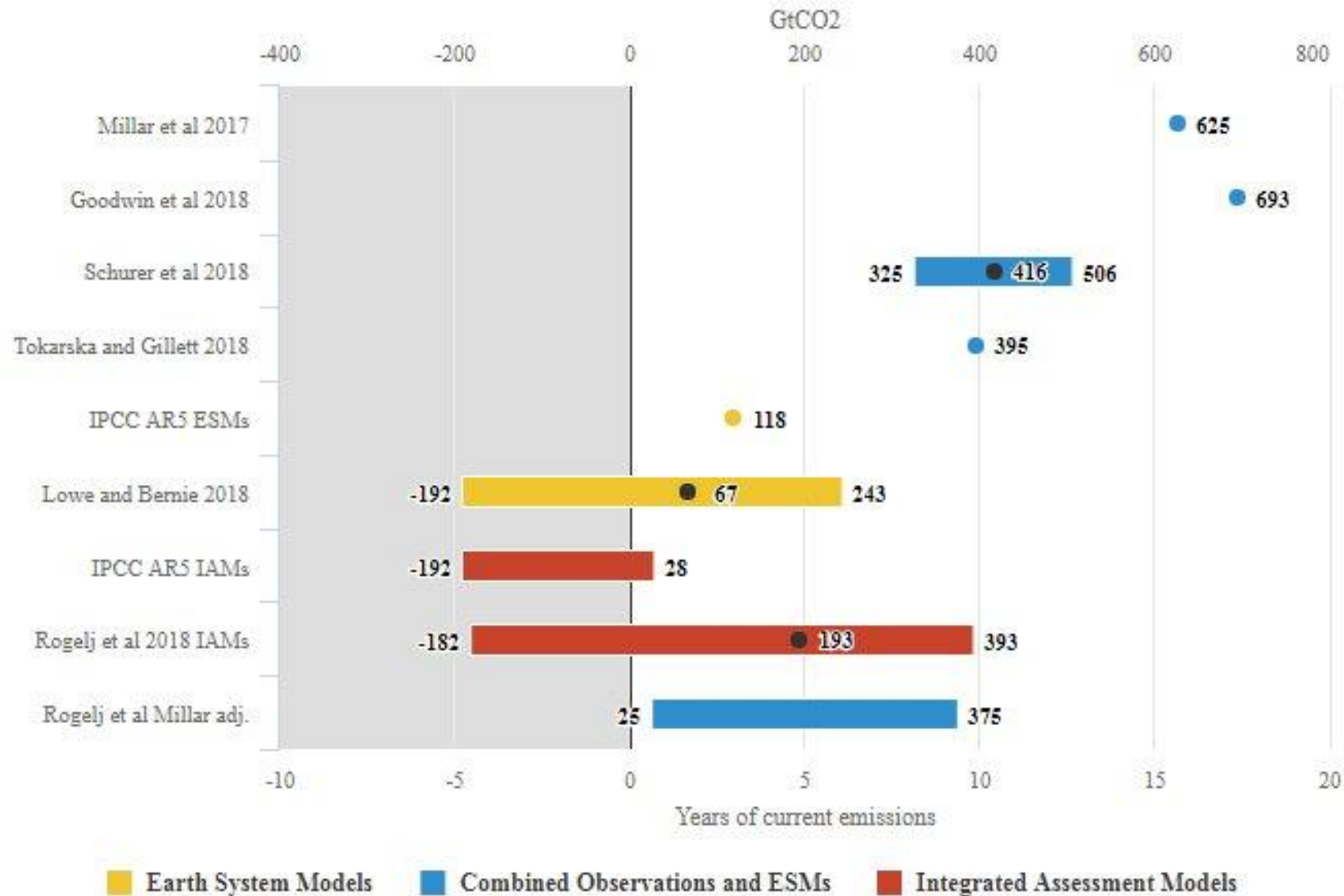


Large-Scale C Management Required

Remaining carbon budget for a 66% chance of less than 1.5C warming



Everything here exists

- Now we're haggling over price
- Lots of room to improve cost & performance

Tech ➡ Policy ➡ Markets & Finance

- Procurement standards
- ZEPS
- CO₂ Utility

45Q tax credit reform is now law

Minimum Size of Eligible Carbon Capture Plant by Type (ktCO ₂ /yr)				Relevant Level of Tax Credit in a Given Operational Year										
Type of CO ₂ Storage/Use	Power Plant	Other Industrial Facility	Direct Air Capture	2018	2019	2020	2021	2022	2023	2024	2025	2026	Beyond 2026	
	Dedicated Geological Storage	500	100	100	28	31	34	36	39	42	45	47	50	Indexed to Inflation
Storage via EOR	500	100	100	17	19	22	24	26	28	31	33	35	Indexed to Inflation	
Other Utilization Processes ¹	25	25	25	17 ²	19	22	24	26	28	31	33	35	Indexed to Inflation	

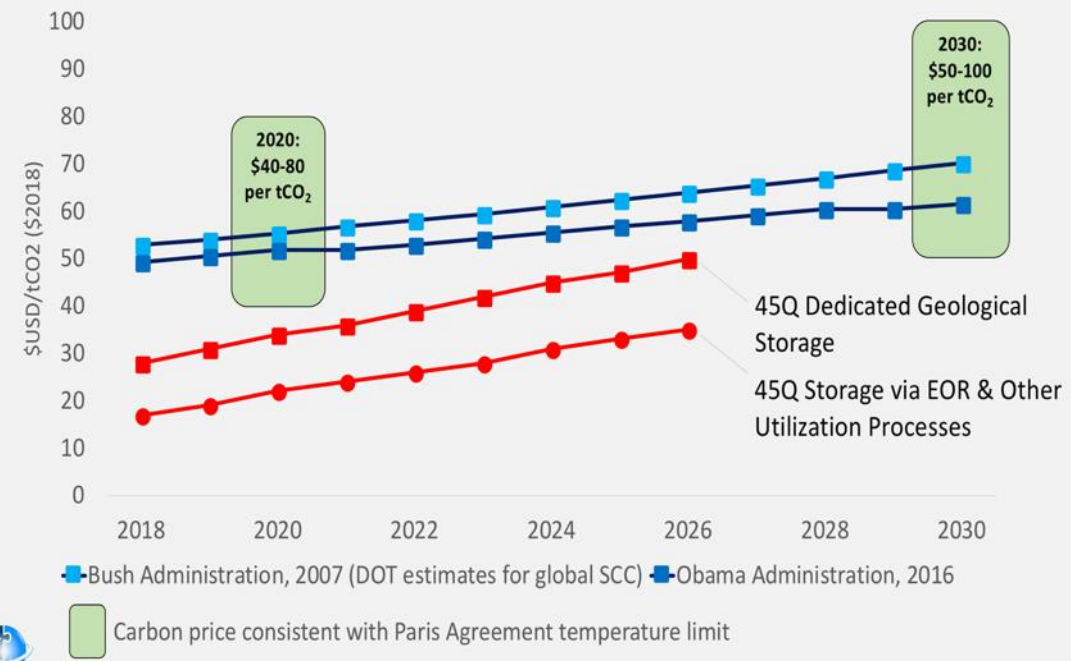
¹ Each CO₂ source cannot be greater than 500 ktCO₂/yr

² Any credit will only apply to the portion of the converted CO₂ that can be shown to reduce overall emissions



ENERGY FUTURES INITIATIVE

Source: Simon Bennett and Tristan Stanley, Commentary: US budget bill may help carbon capture get back on track, International Energy Agency.

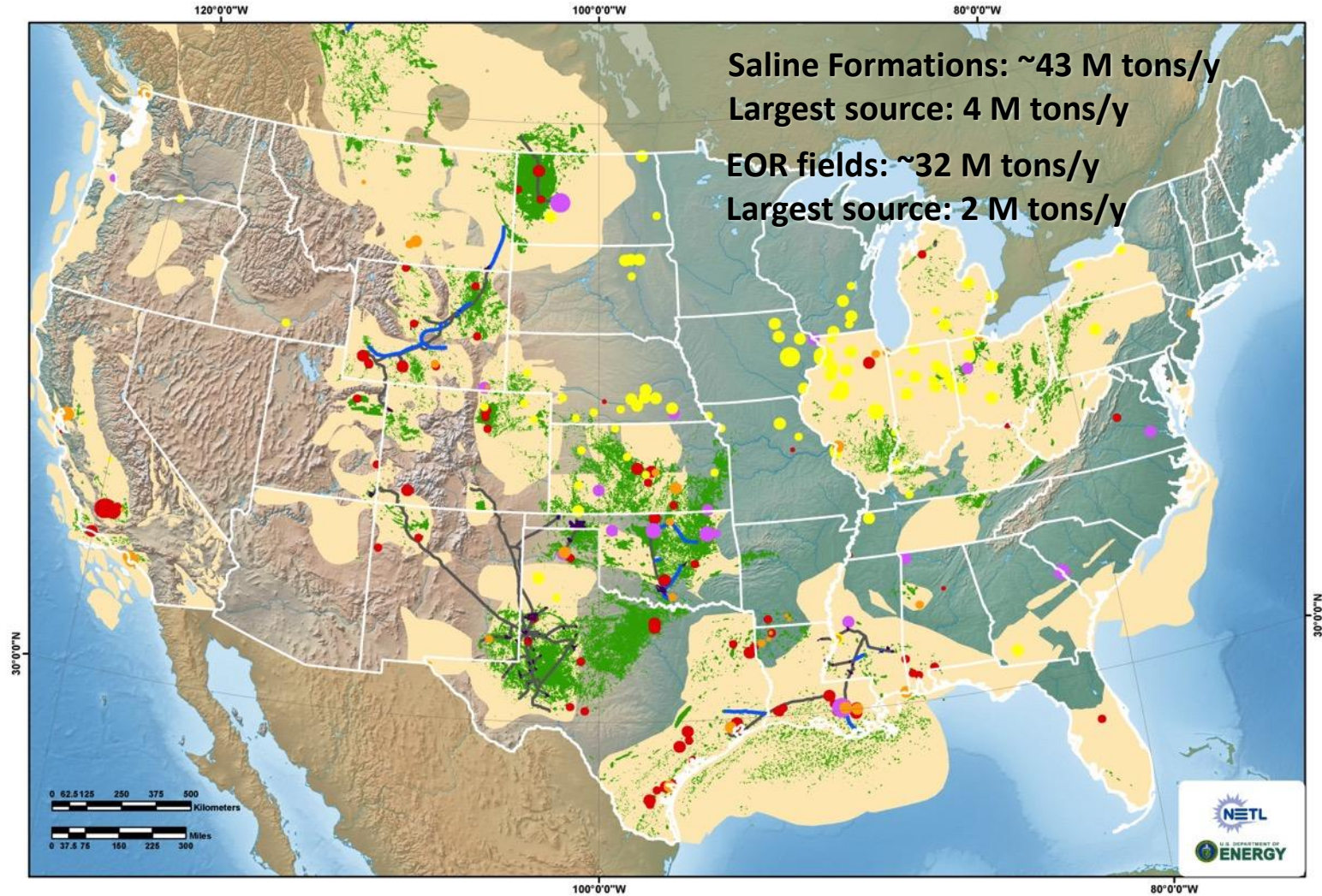


ENERGY FUTURES INITIATIVE

Source: EFI, 2018. Data compiled from EPA, DOT, Carbon Pricing Leadership Coalition, IEA.

Industrial CCS can make a BIG difference

High Purity Sources of CO₂ within 100 miles of a potential CCUS site



Shell Quest Project

Scottsford Upgrader, Alberta



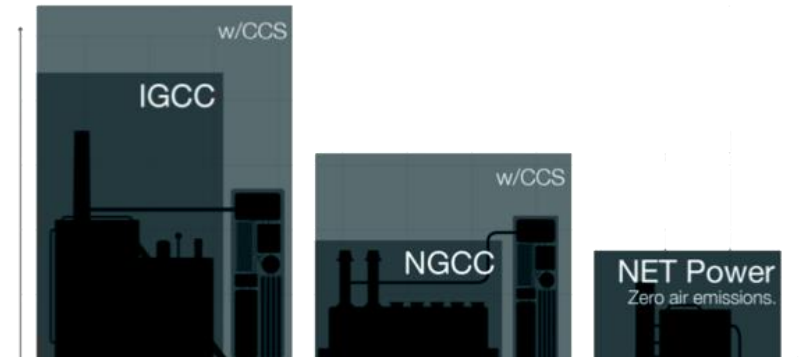
60% decarb: \$1.60/kg
90% decarb: \$2.40/kg

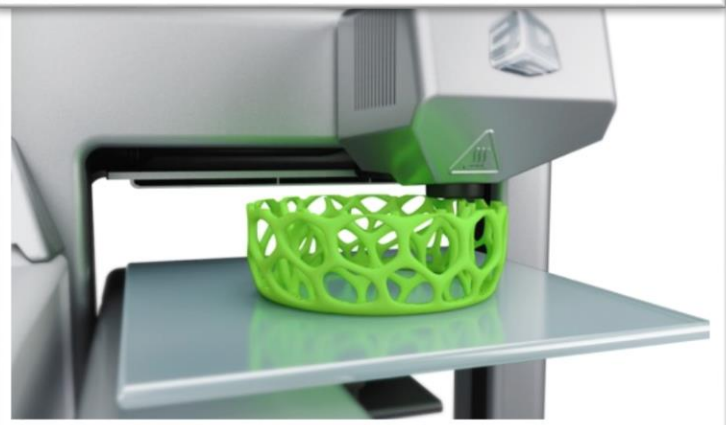
Fully operational Sept. 2015
Over 2 Million tons/y into saline formations

New Tech: NetPower



- **100% CO₂ stream, at pressure**
- **Produces water**
- **Nth plant: ~price parity to NGCC**
- **Can ramp up & down**
- **Addl. potential revenues**







New Tech: Solidia



Today:

- pre-cat forms only
- Set up within existing asset class
- 30 concrete blocks = 1 tree

Cement:

- 52% LCA reduction measured
- Lower production cost, total cost
- On track to 70% LCA reduction

Concrete:

- 85% water reduction
- Higher compressive & tensile strength
- Lower corrosion
- Looks better

New tech: Climeworks



The world's first commercial direct air capture plant
36,000 trees worth of CO₂ uptake

Restoration Engine: turning CO₂ to stone: Climeworks + CarbFix
Hellisheidi Power Station, Reykjavik



Generation Engine: turning CO₂ to fuel: Carbon Engineering+ Greyrock
Squamish, British Columbia



