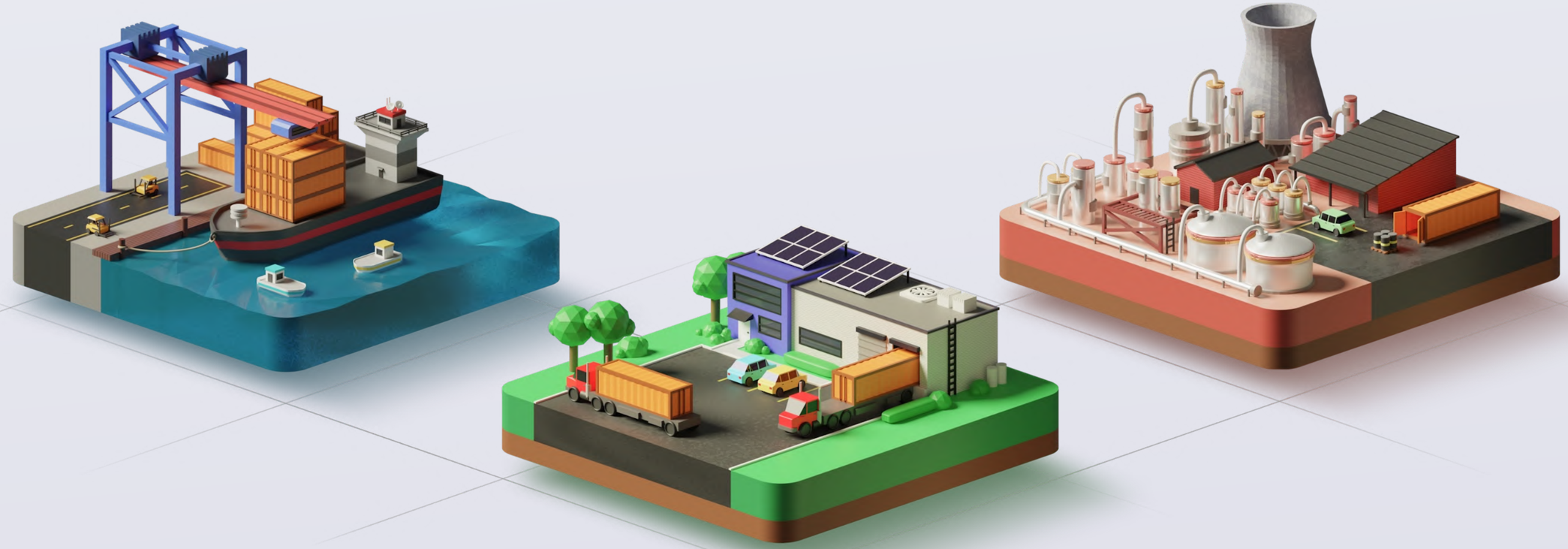
ACTUAL

AI for Sustainability Outcomes

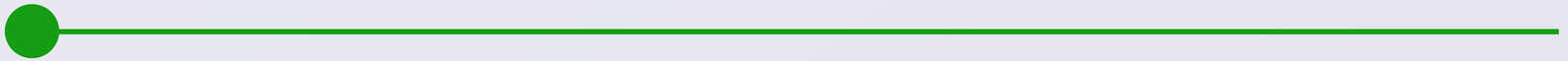


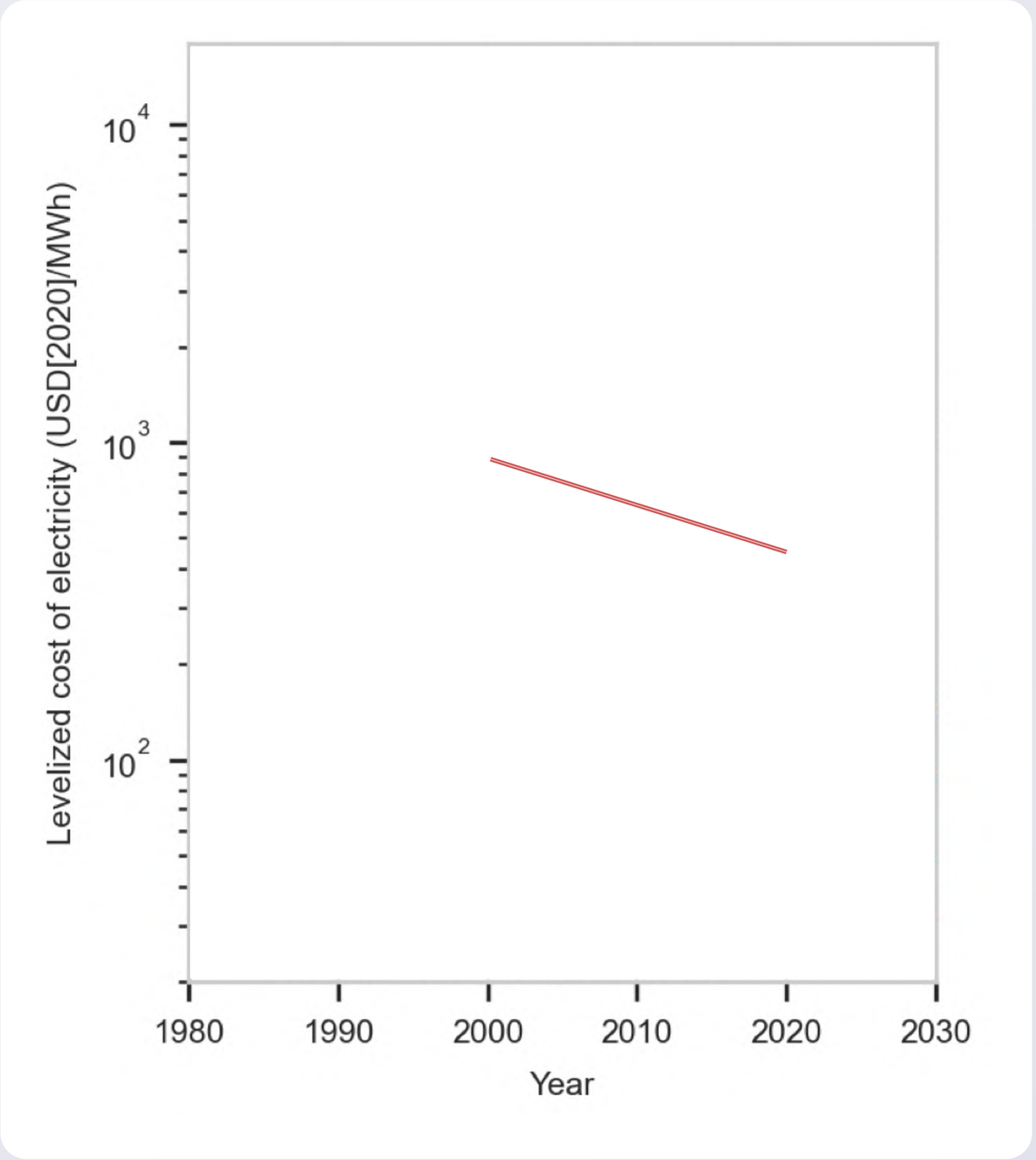
TIME BEST INVENTIONS 2022

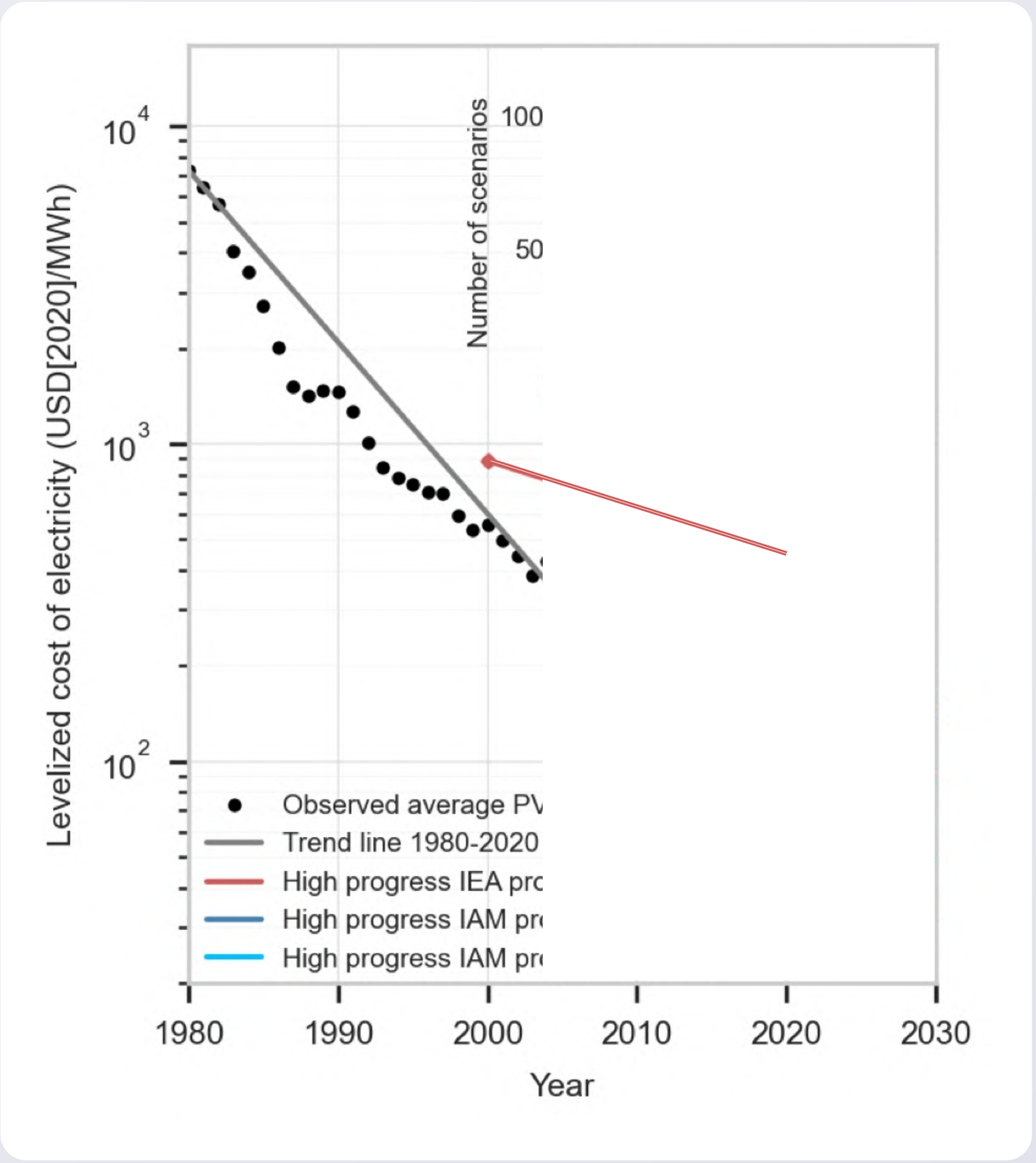
LAB

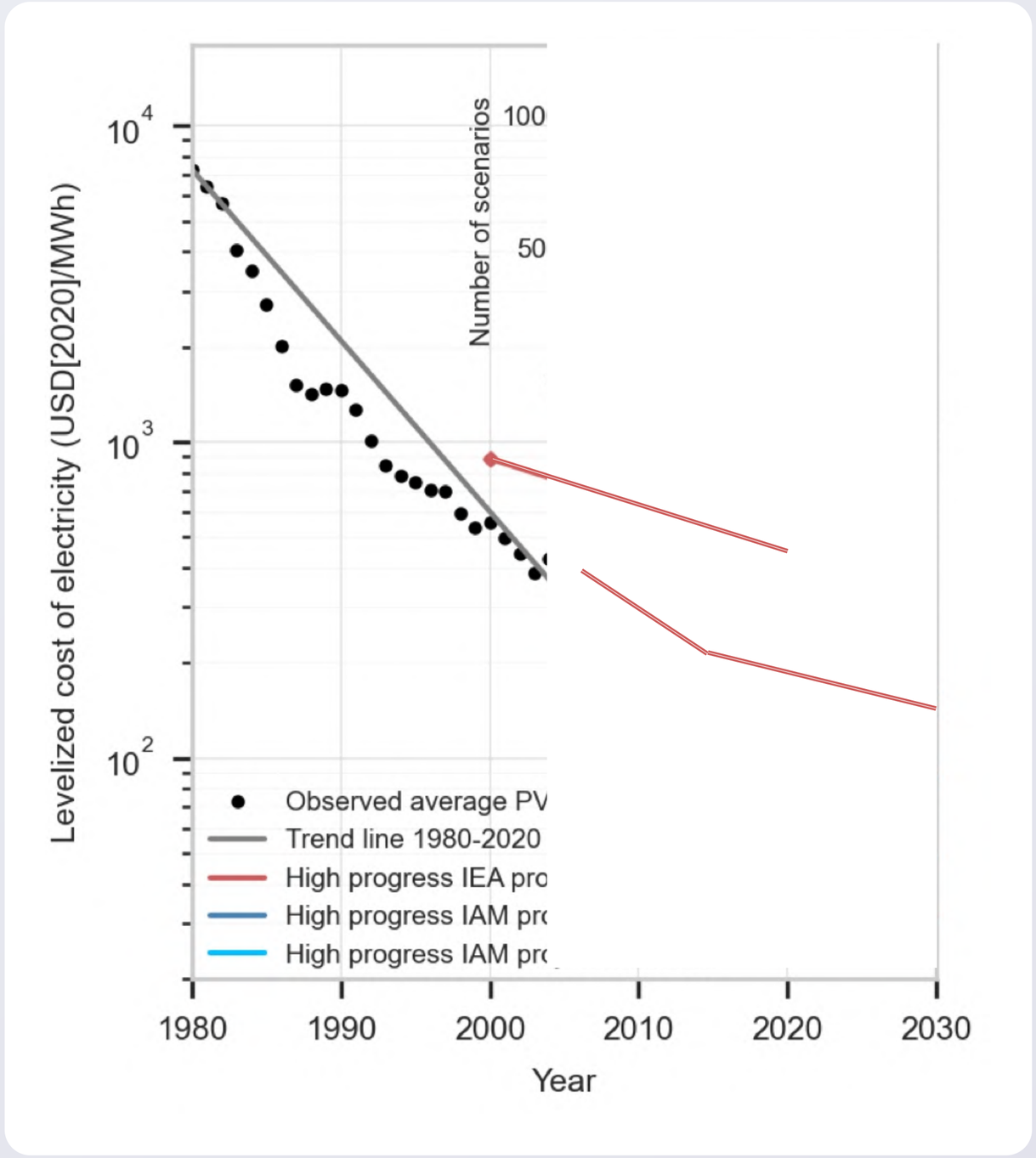
DEPLOYMENT

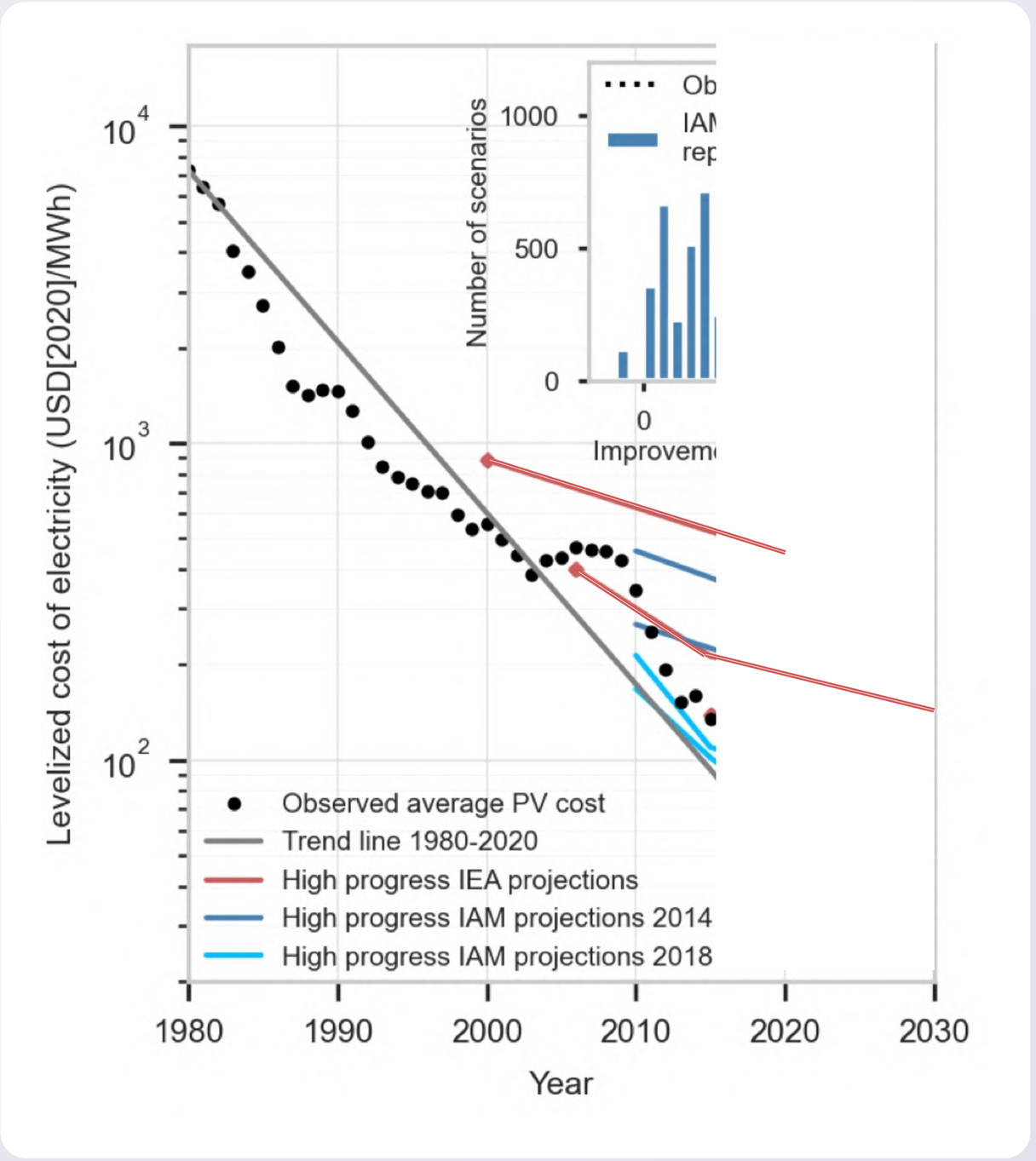
OPERATIONS

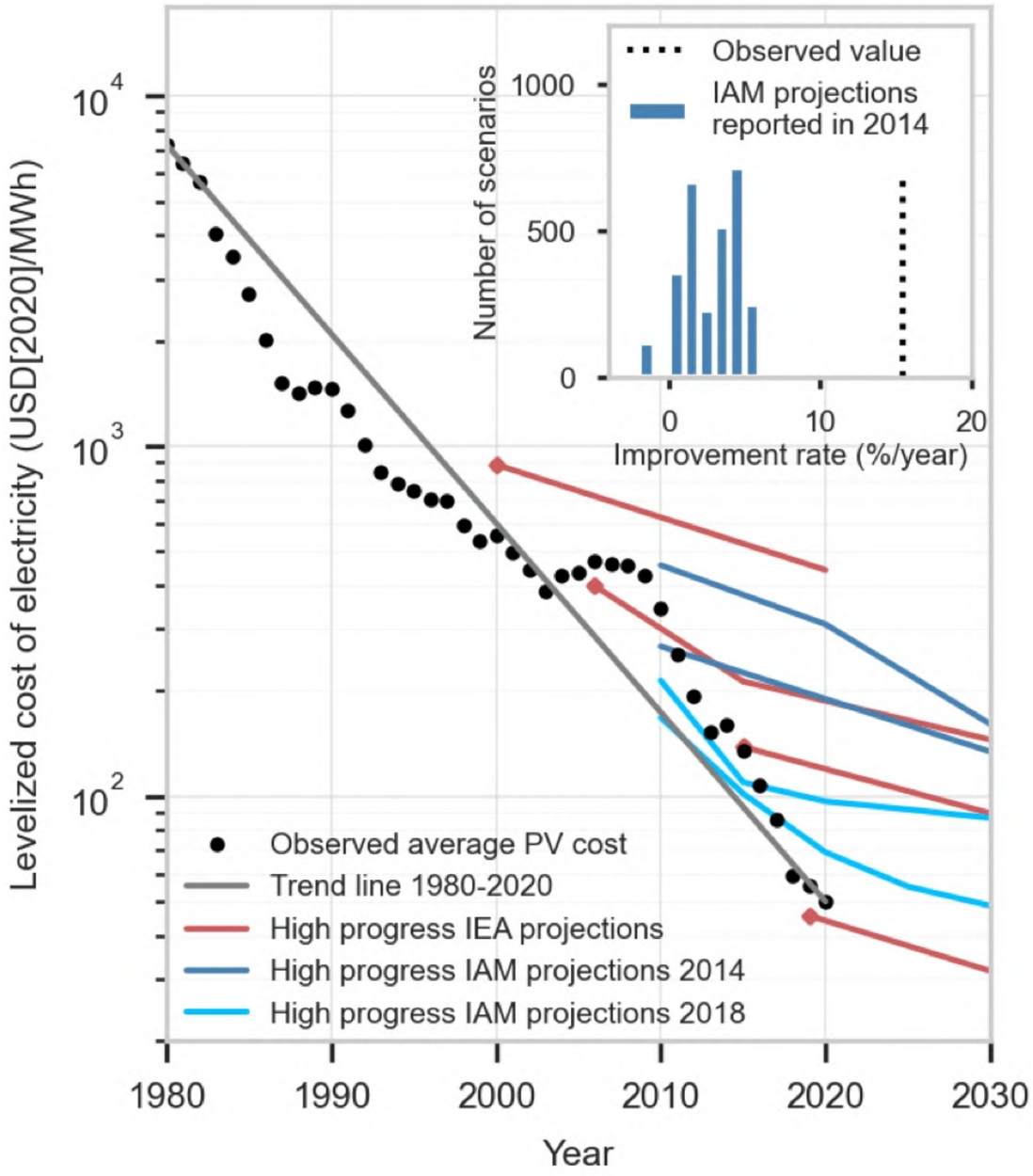

LAB
DEPLOYMENT
OPERATIONS


Levelized cost of electricity (USD[2020]/MWh)
10^4
10^3
10^2
1980
1990
2000
2010
2020
2030
Year


Levelized cost of electricity (USD[2020]/MWh)
10^4
10^3
10^2
Number of scenarios
100
50
Observed average PV
Trend line 1980-2020
High progress IEA pro
High progress IAM pr
High progress IAM pr
1980
1990
2000
2010
2020
2030
Year


Levelized cost of electricity (USD[2020]/MWh)
10^4
10^3
10^2
Number of scenarios
100
50
Observed average PV
Trend line 1980-2020
High progress IEA pro
High progress IAM pr
High progress IAM pr
1980
1990
2000
2010
2020
2030
Year


Levelized cost of electricity (USD[2020]/MWh)
10^4
10^3
10^2
1980
1990
2000
2010
2020
2030
Year
Observed average PV cost
Trend line 1980-2020
High progress IEA projections
High progress IAM projections 2014
High progress IAM projections 2018
Number of scenarios
1000
500
0
0
Improvem
Ob
IAM
rep



Joule

Volume 6, Issue 9, 21 September 2022, Pages 2057-2082

Article

Empirically grounded technology forecasts and the energy transition

Rupert Way [1 2 6], Matthew C. Ives [1 2], Penny Mealy [1 2 3], J. Doyne Farmer [1 4 5]

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[2] Smith School of Enterprise and the Environment, University of Oxford, Oxford OX1 3QY, UK
[3] SoDa Labs, Monash Business School, Monash University, Melbourne, VIC 3800, Australia
[4] Mathematical Institute, University of Oxford, Oxford OX2 6GG, UK
[5] Santa Fe Institute, Santa Fe, NM 87501, USA

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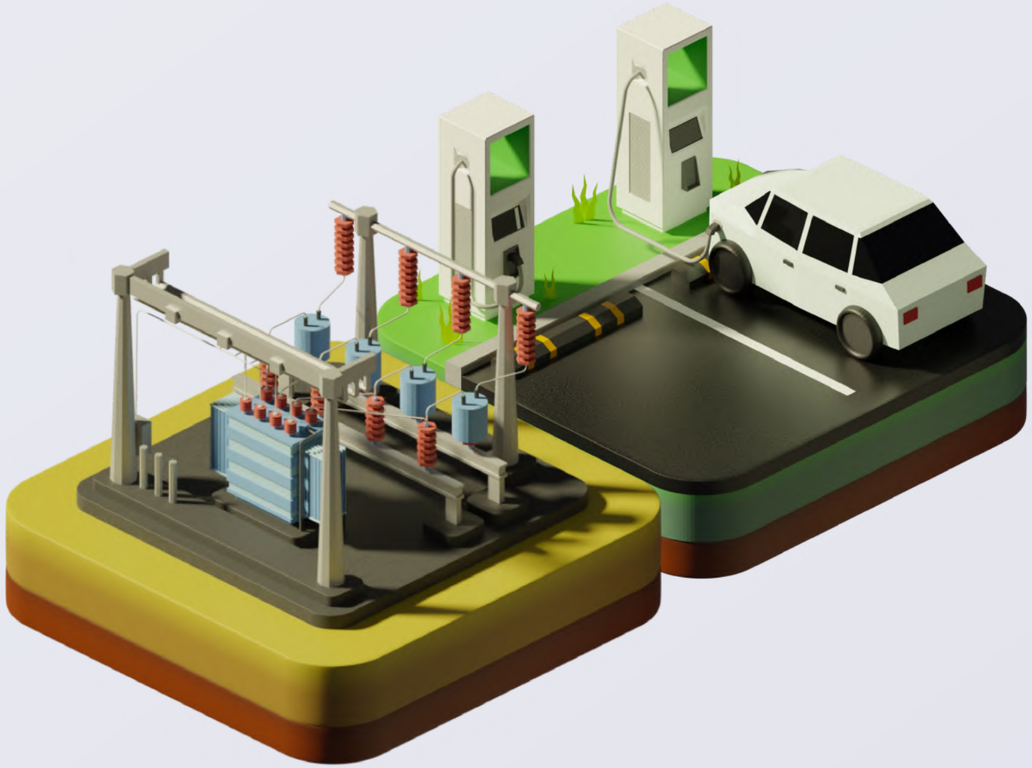
Published: September 13, 2022


Improving learning rates
Improving learning rate
projections


LAB
DEPLOYMENT
OPERATIONS




GO MART


Maximum Demand Charge ($)
> 30
20 – 30
10 – 20
1 – 10
0
No Data


Maximum Demand Charge ($)
> 30
20 – 30
10 – 20
1 – 10
0
No Data
a
b
c
Annual percentage change in power density
Annual percentage change in weather variability
Annual percentage change in drought severity
10.00
1.00
0.10
0.01
−0.01
−0.10
−1.00
−10.00
Parallel lines indicate regions without statistically significant trends

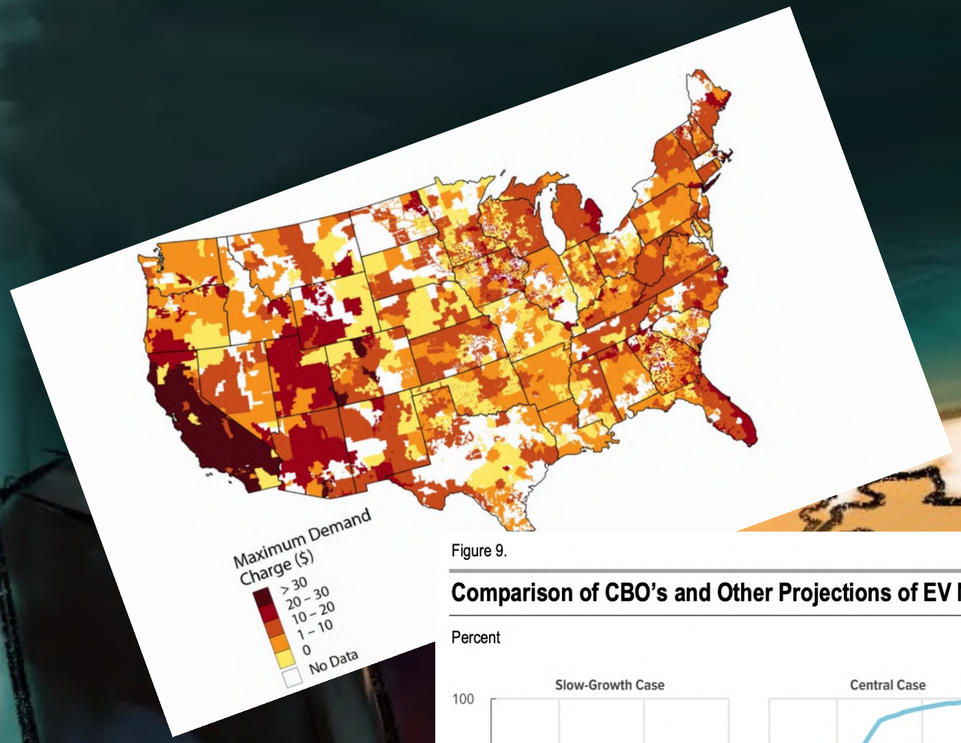
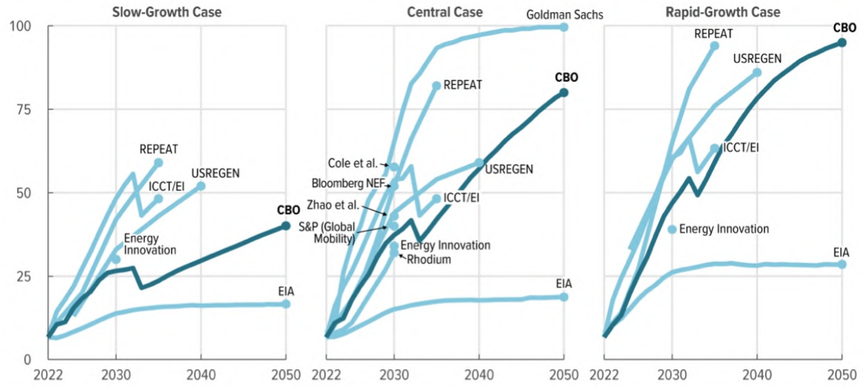


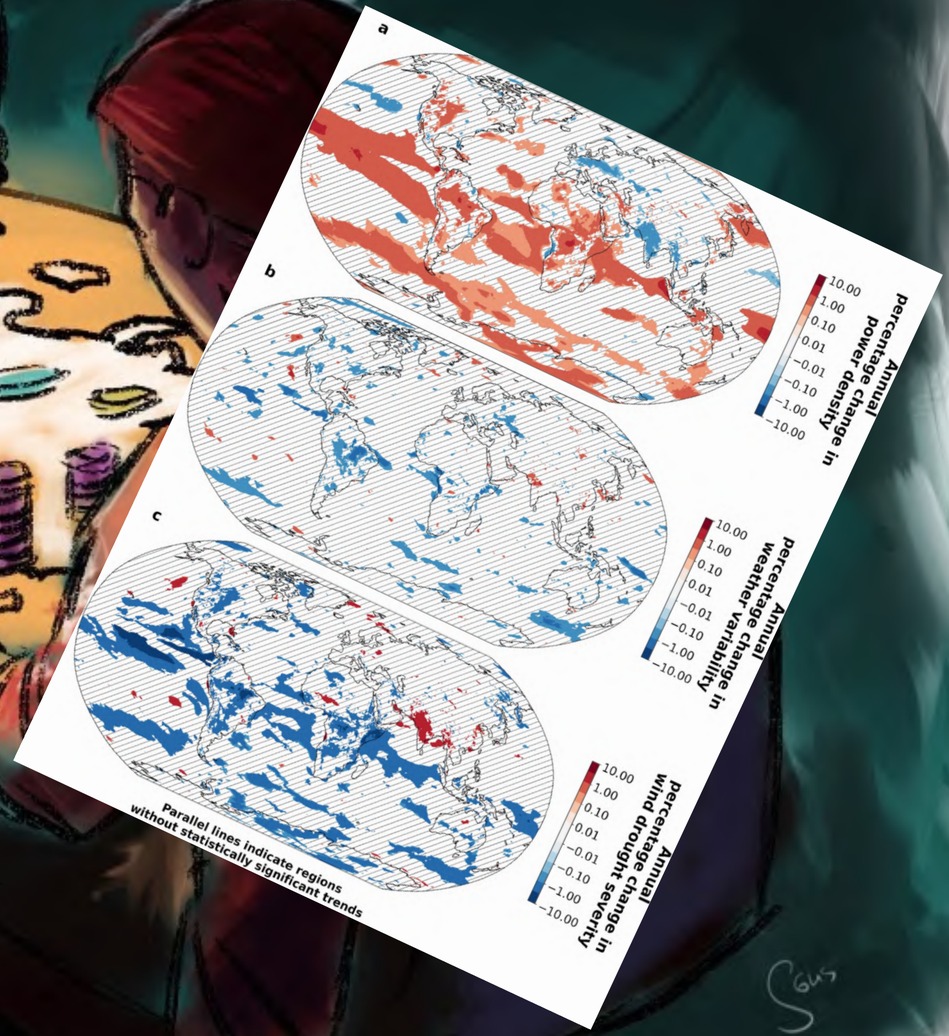
Figure 9.

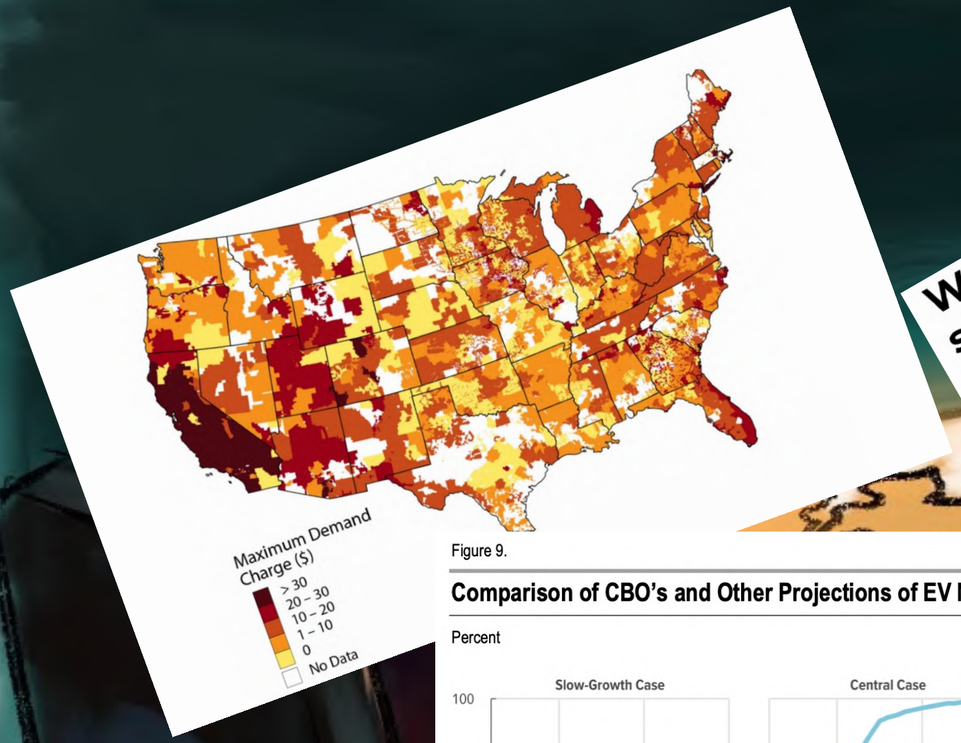
Comparison of CBO's and Other Projections of EV Market Share

Percent



Data source: Congressional Budget Office. See www.cbo.gov/publication/58964#data.





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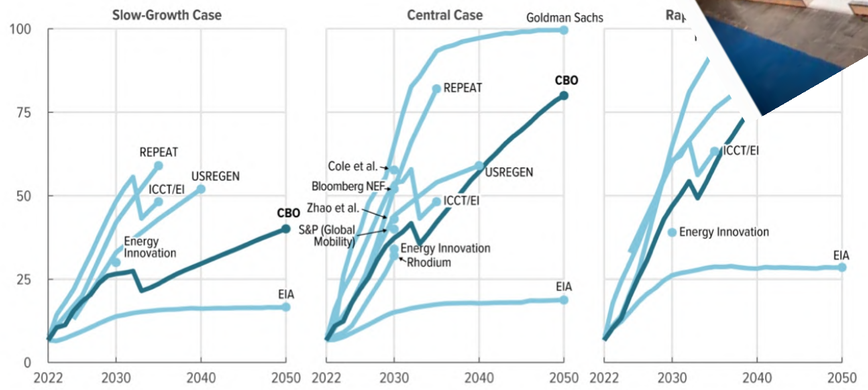
Percent



Data source: Congressional Budget Office. See www.cbo.gov/publication/58964#data.

World's largest EV battery maker set to cut costs in half by mid 2024

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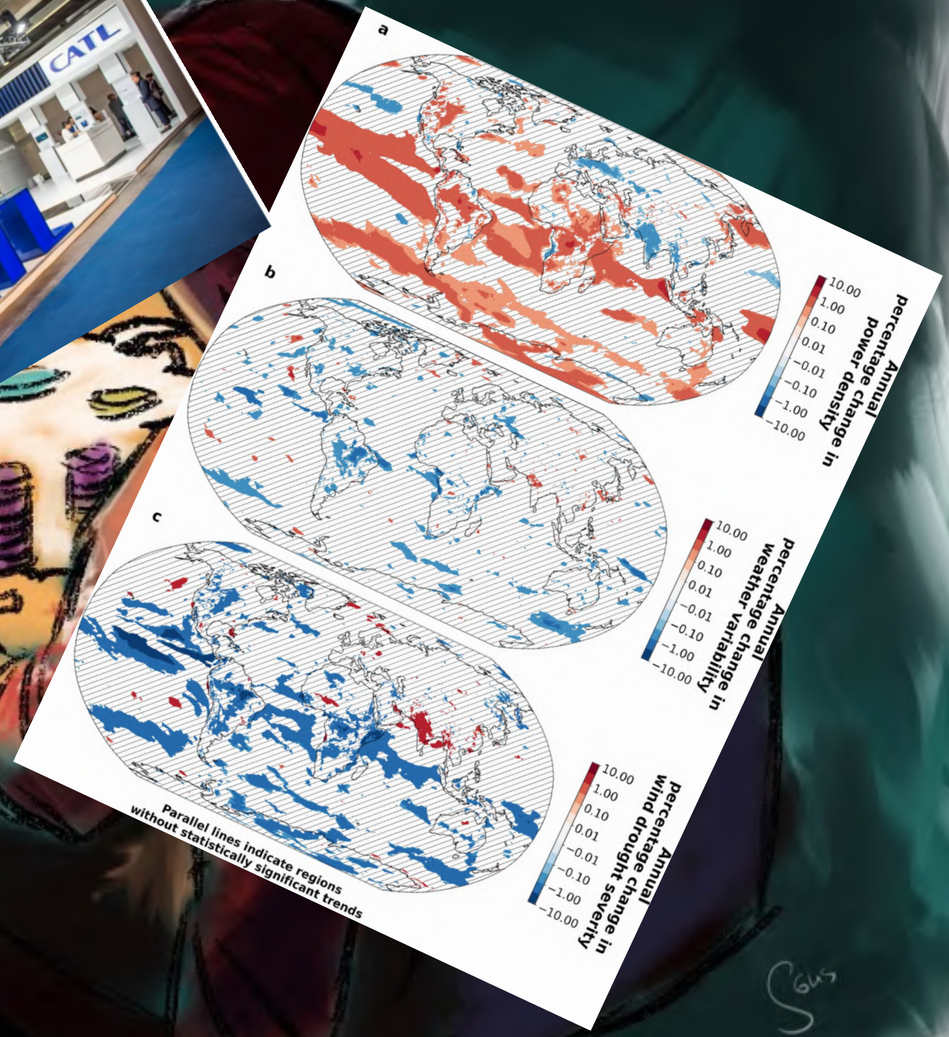
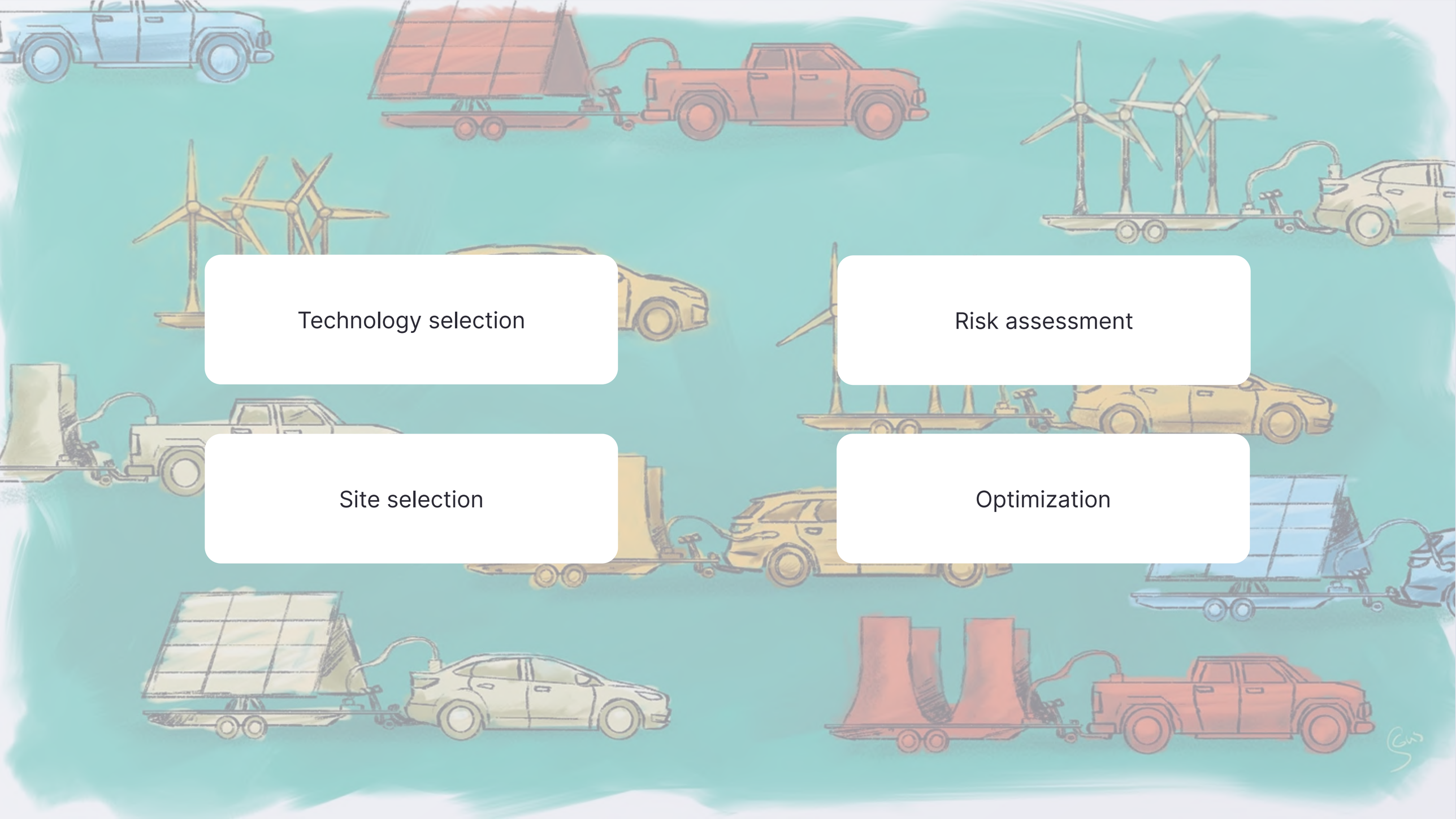



HYDROGEN
GO MART


Technology selection
Risk assessment
Site selection
Optimization


LAB
DEPLOYMENT
OPERATIONS
(Learning)


C10
HYDROGEN

Table 9.6 Cost Details for ASHRAE RP-863 Study (Caneta 1995)

Building Type		Golf Clubhouse	Secondary School	Elementary School	Office	Education Center	Hotel
Installation Date		1990	1992	1992	1993	1993	1995
Location		Pennsylvania	Ontario	Minnesota	Virginia	New York	Pennsylvania
Building Size	ft^2	15,000	181,000	78,000	26,700	8000	39,900
	m^2	1400	16,800	7250	2480	745	3700
Heat Pump Capacity	tons	25.5	410	193	100	24	97
	kW	90	1442	679	352	84	341
GSHP System Cost	$	40,000	2,595,000	706,100	325,800	75,000	269,380
GSHP System	$/ton	1569	6329	3659	3258	3125	2777
	$/kW	446	1800	1040	926	889	790
GSHP System	$/$ft^2$	2.67	14.34	9.05	12.20	9.38	6.75
	$/$m^2$	29	154	97	131	101	73
Vertical Bore Length	ft	3000	72000	28000	15840	4000	9000
	m	914	21946	8534	4828	1219	2743
Vertical Bore	ft/ton	118	176	145	158	167	93
	W/m	98	66	80	73	69	124
Ground-Loop Cost	$	9000	1,030,200	176,500	92,030	59,040	61,950
Ground Loop	$/ton	353	2513	915	920	2460	639
	$/kW	100	714	260	262	699	182
Ground Loop	$/ft	3.00	14.31	6.30	5.81	14.76	6.88
	$/m	9.84	46.93	20.68	19.06	48.41	22.58

Source: ASHRAE Geothermal Heating and Cooling: Design of Ground-Source Heat Pump Systems

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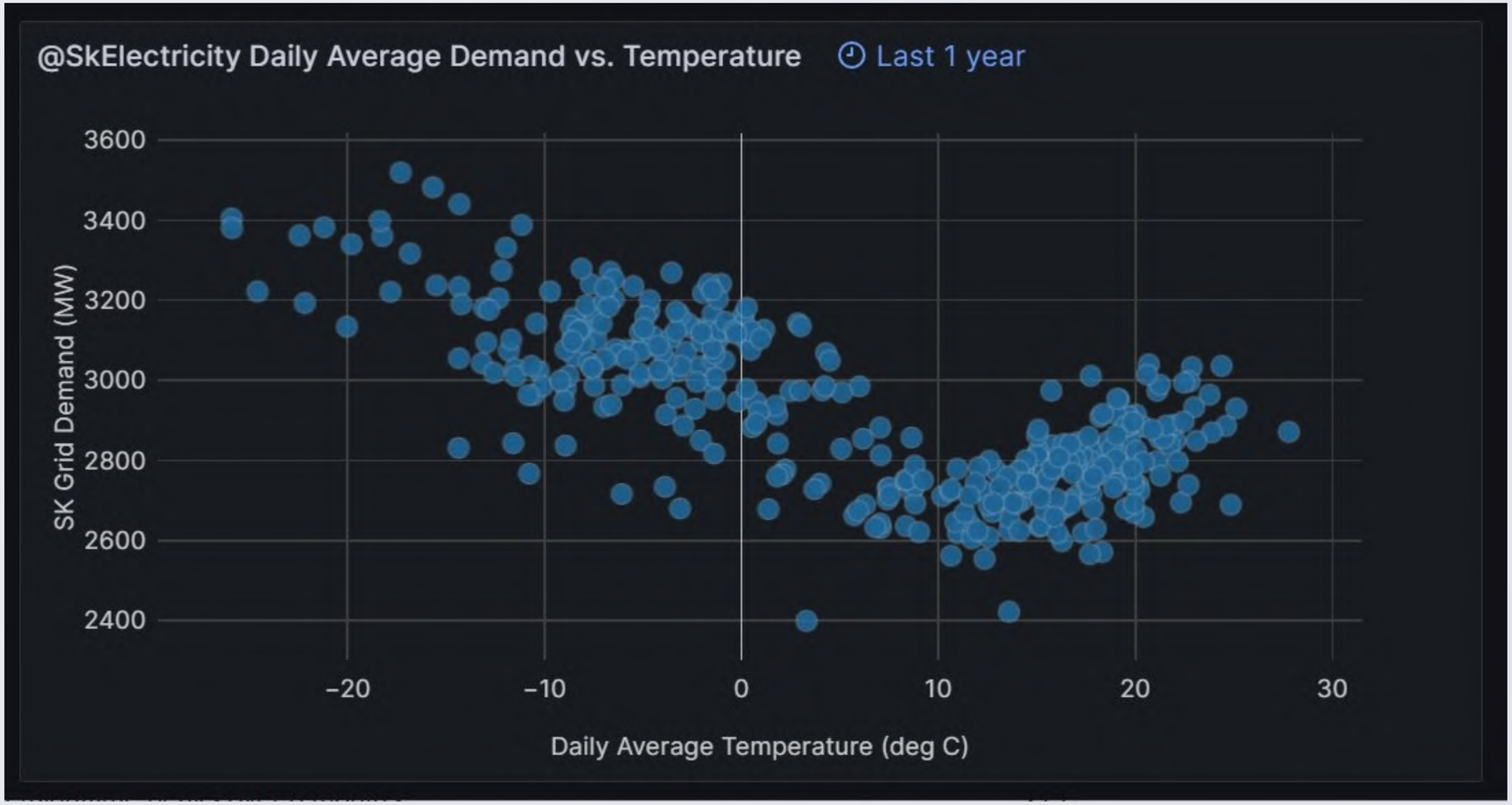
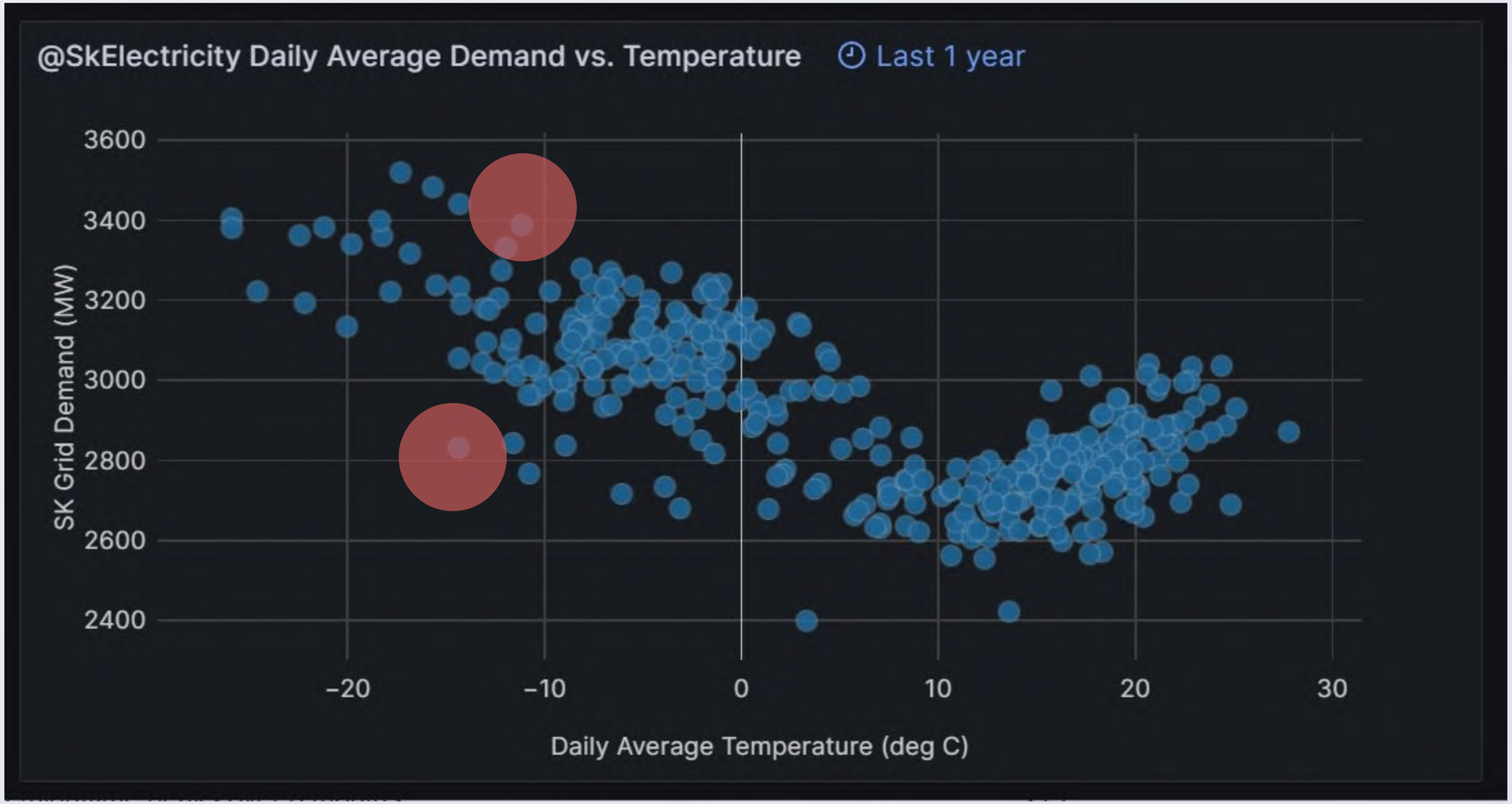


Source: Grid Saskatchewan skelectricity.info



Source: Grid Saskatchewan skelectricity.info

Closing the loop from field to research

Successive improvement of deployments

Improved Localization

FORTUNE

A Silicon Valley startup inspired by SimCity gamified decarbonization and now is helping New Zealand sheep farmers reduce their 'fart tax' liabilities

BY IAN MOUNT

November 8, 2022, 5:00 AM PST

Companies use ACTUAL's capital planning technology to turn sustainability intention into reality.

THE WALL STREET JOURNAL. Forbes FORTUNE Gartner

BUSINESS INSIDER TIME FAST COMPANY IDC

TIME BEST INVENTIONS 2022

From Data to Gamified Action

Actual ESG Transformation Platform

FAST COMPANY INNOVATION BY DESIGN 2023

The best sustainable designs of 2023

Sustainability Transformation Platform

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