Low-Cost Short & Long Duration Energy Storage

OIL WELLS THAT **END WELL**

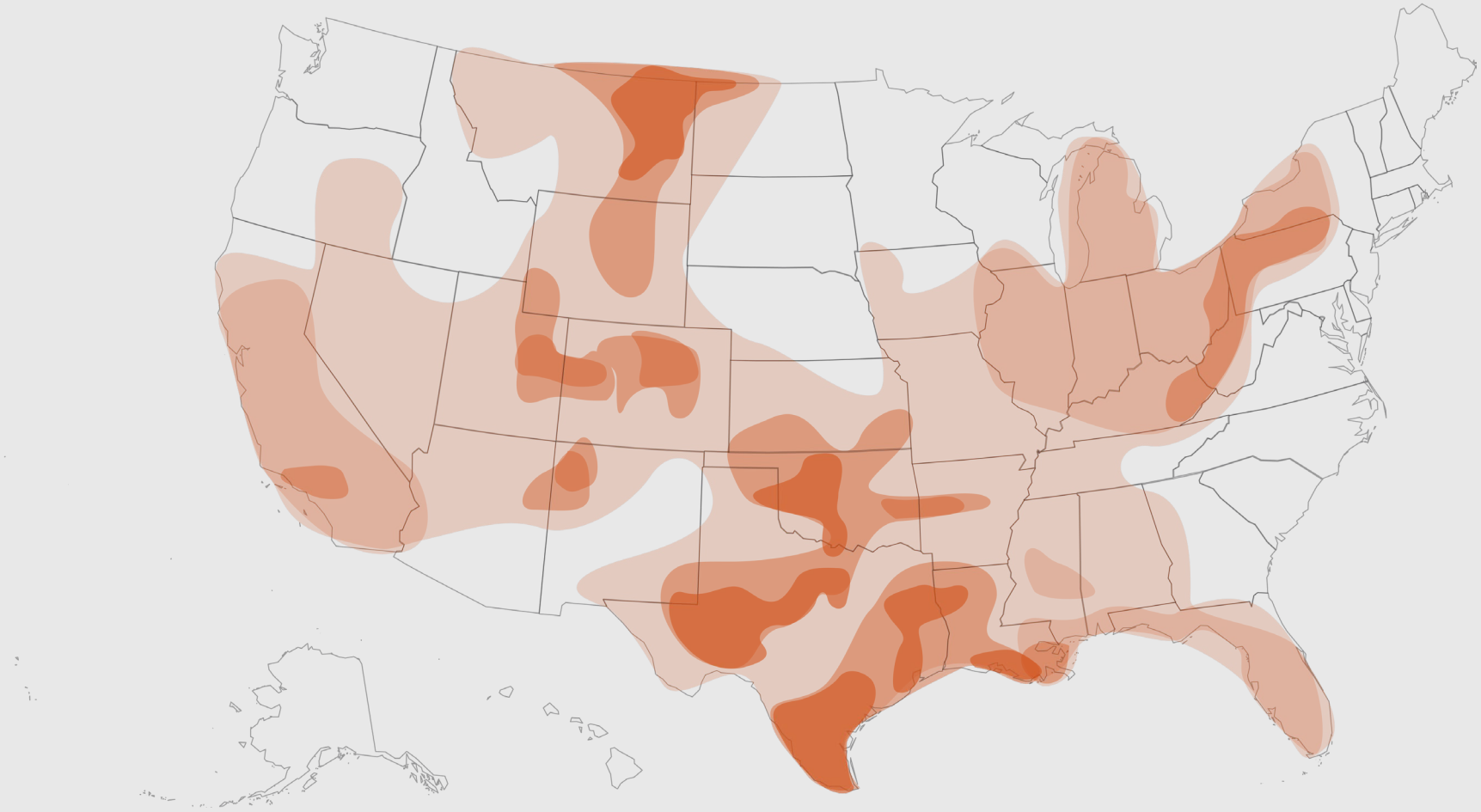
RENEWELL

RENEWELL

Mission

Renewing the world's energy infrastructure by converting oil and gas's largest liability into our grid's greatest asset

2.5 million idle and orphan wells in North America

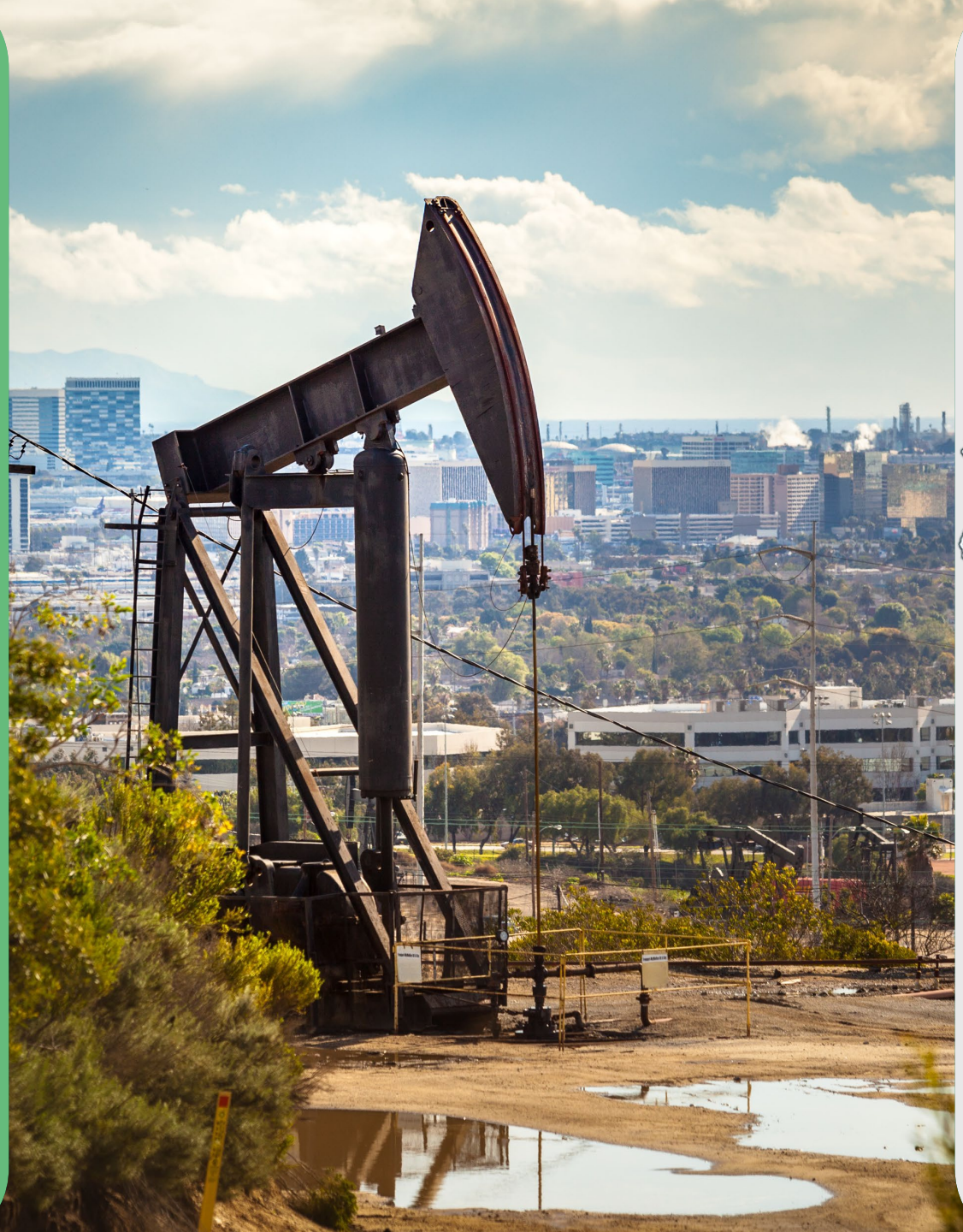


RENEWELL

$394 billion

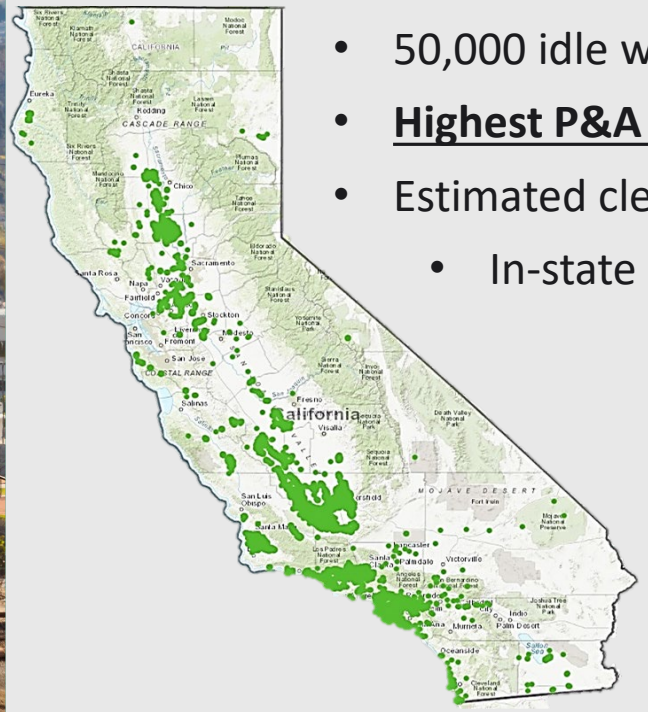
Problem #1: Billions required to clean up all oil and gas wells in North America.

Sources: Enverus Drilling Info, Decommissioning Orphaned and Abandoned Oil and Gas Wells: New Estimates and Cost Drivers by Daniel Rami , July 14th, 2021



Why now? California Example

California's liability challenge



- 50,000 idle wells / 50,000 active wells
- **Highest P&A costs in US**
- Estimated clean up cost: $13B
  - In-state O&G projected profits: $6B

Source: Enverus DrillingInfo, Carbon Tracker's "There will be blood": Dwayne Purvis 2023, Energy Information Administration, Sacramento Bee

P&A Problem Requires a Market-Based Solution

Repurposement can be better than Removal

- adds new value to the local energy system
- reduces risk of a well becoming orphan – protecting taxpayers
- operators and the workforce gain central role in the evolving energy system
- must make financial sense for the operator
- more likely in states with pressure to decommission inactive/idle wells

GLIDES
GEOTHERMAL
CAES

CCUS
THERMAL ENERGY STORAGE
GRAVITY WELLS

Gravity Well: 2-in-1 Solution

A Gravity Well is a plugged, monitored, and secured idle well ready to serve as a mechanical battery for 30+ years.

This is how the conversion works…

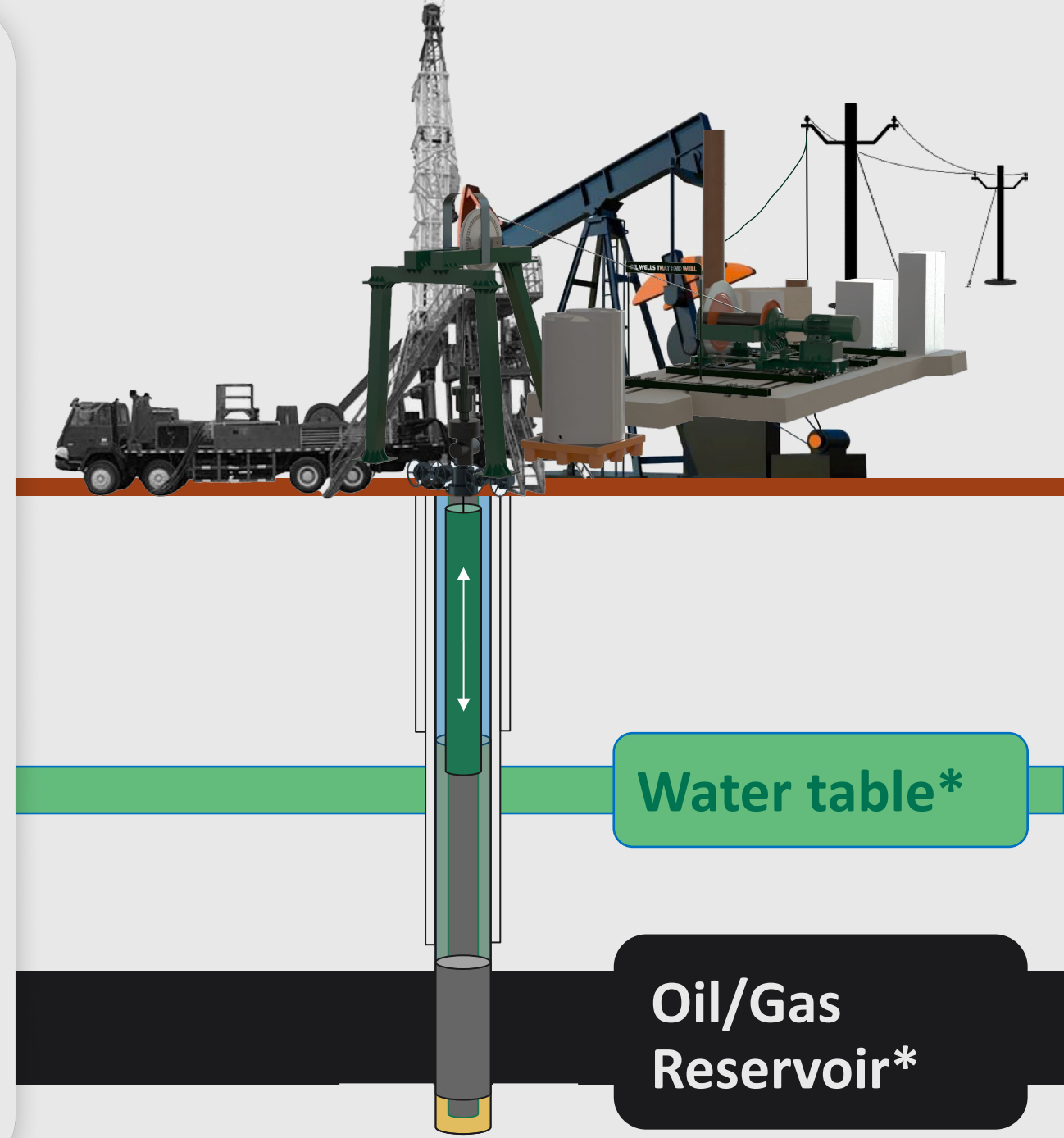
The result is a well that is:

<u>Plugged and Protected</u>

- Lower cost than traditional P&A
- Plug (cement or steel) seals oil/gas reservoir
- Wellhead equipment for spill protection

<u>Monitored 24/7</u>

- Methane gas leak detection
- Mechanical integrity tests
- Hydrocarbon migration alert



*not to scale

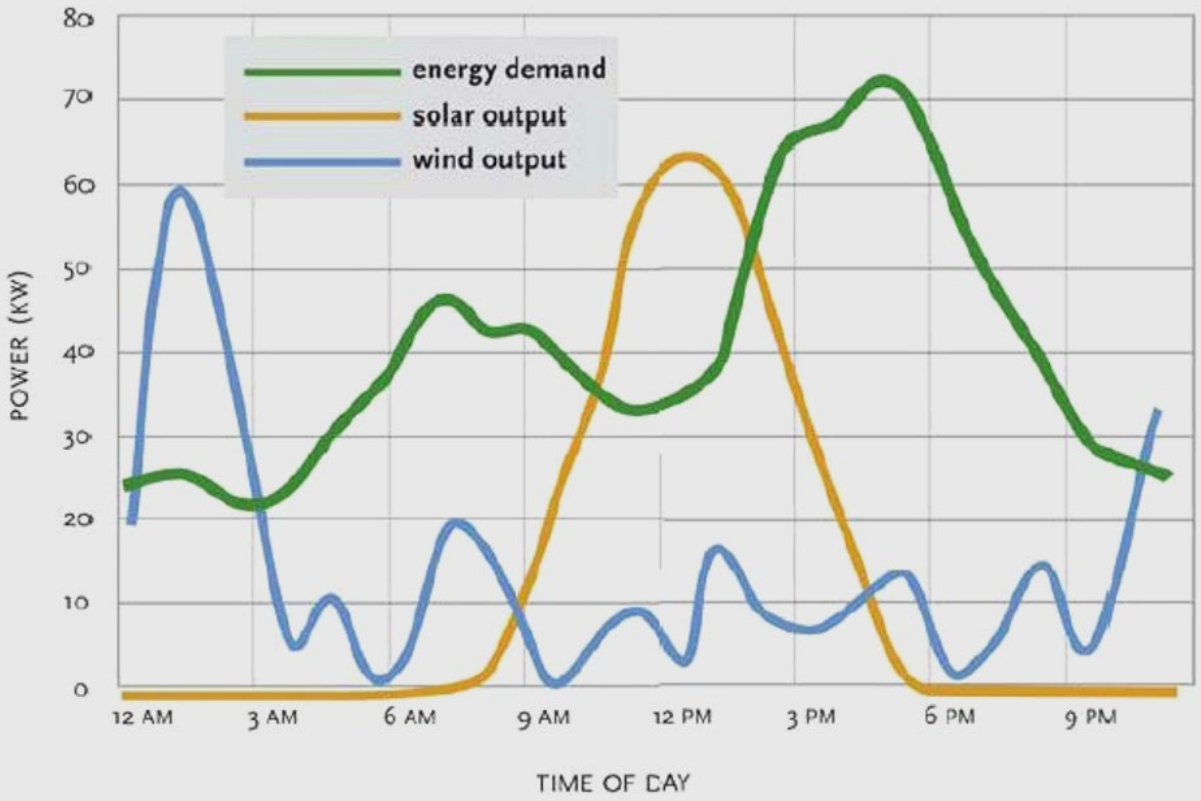
$430 billion

Problem #2: Billions to build the 3,530-gigawatt hours of energy storage – projected deployment by 2050.

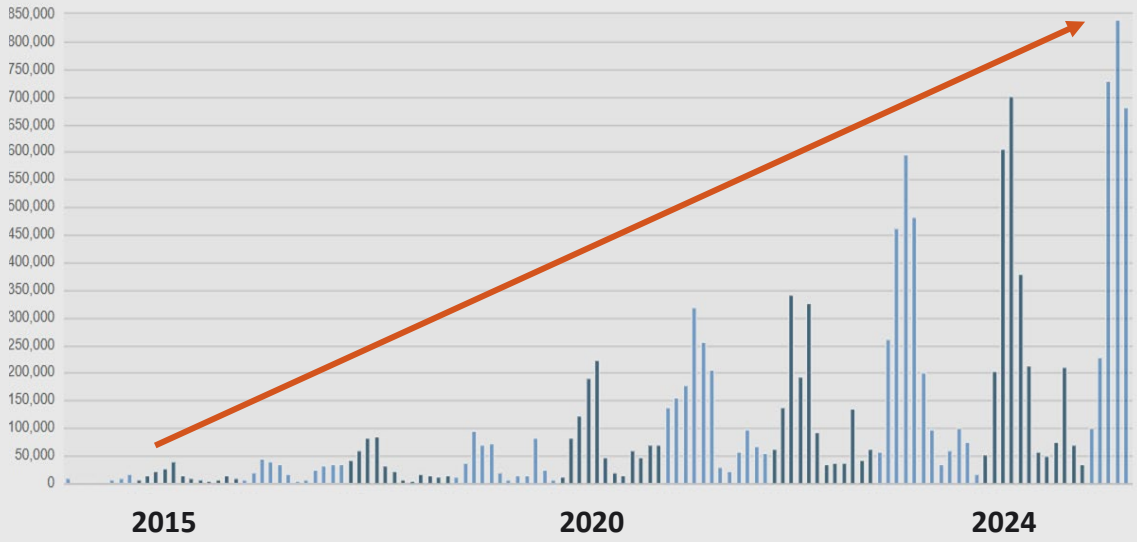
Source: NREL Storage Futures Series

Why is so much Energy Storage being deployed?

Wind and Solar's Supply Curve Don't Match Demand



Wind and Solar Curtailments are Skyrocketing



Gravity Energy Storage: Overview

It's just potential energy

$$U = mgh$$

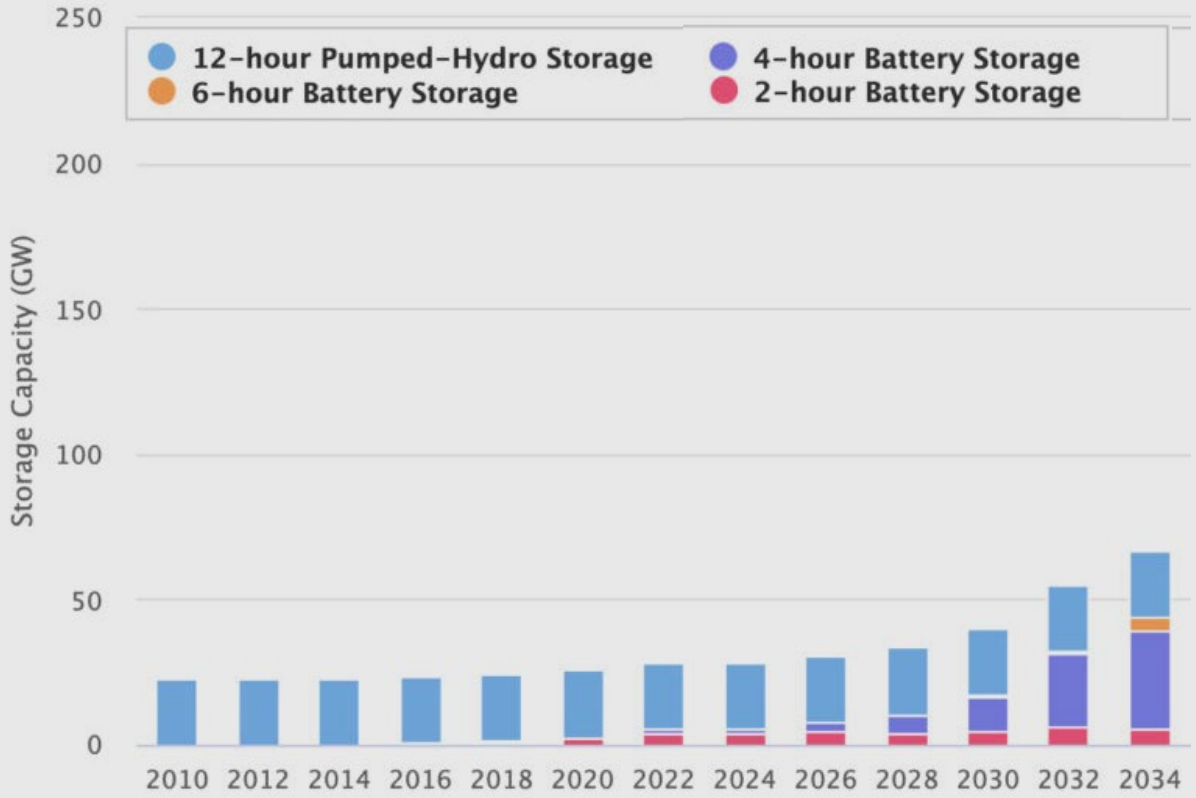
U = gravitational energy

m = mass

g = gravitational field

h = height

It's by far the most prevalent energy storage



Source: NREL Energy Futures Report

Gravity Energy Storage: In the News

General Growth

Gravity Energy Storage Systems Market Size More Than Doubles at a Robust CAGR of 13.4% during 2023–2029 | GlobeNewswire

Energy Vault to Develop 100 MW Hybrid Gravity Energy Storage System
EnergyTech

Two massive gravity batteries are nearing completion in the US and China

Can gravity batteries solve our energy storage problems?
16 May 2022
BBC

Investment Traction

Gravity energy storage firm Energy Vault raises USD 100m to back deployments

Australian gravity energy storage startup secures AU$9 million in Series A funding
Energy Storage NEWS

Gravitricity Overview

Year Founded	Status	Employees
2011	Private	21

Latest Deal Type	Latest Deal Amount
Later Stage VC	$48.7M

15th October 2024

GREEN GRAVITY CLOSES SERIES A CAPITAL RAISE

Gravity Energy Storage: Why are wells well-suited?

It's just potential energy

$$U = mgh$$

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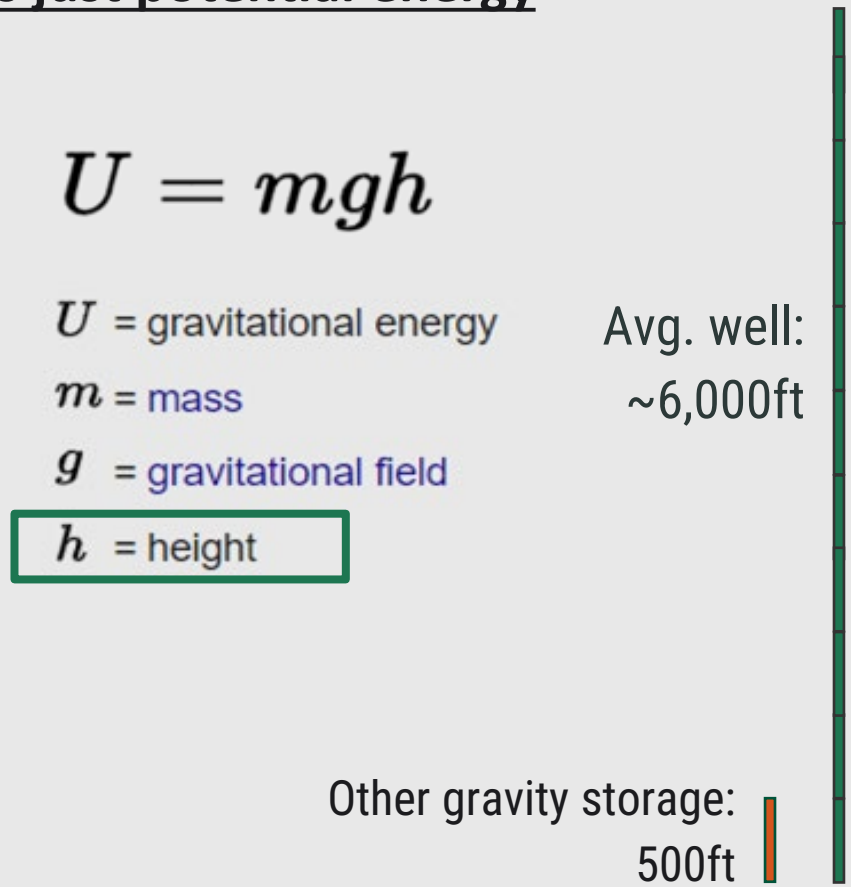


Additional Benefits

- Existing electrical infrastructure
- Existing interconnection agreements
- Oilfield expertise
  - Well service tools, companies, service methods, and experts
- Often co-located with high-value variable energy generation sites

Wells are expensive to remediate through traditional means

Gravity Energy Storage: Why are wells challenging? Site Selection

Energy Storage Markets

- Mandatory, but nascent and highly variable
- Structures vary from region to region within states
- In states with no wholesale market (Colorado), storage purchases are only performed through RFPs – difficult to foresee price point

Plug and Abandonment / Well Data

P&A Planning

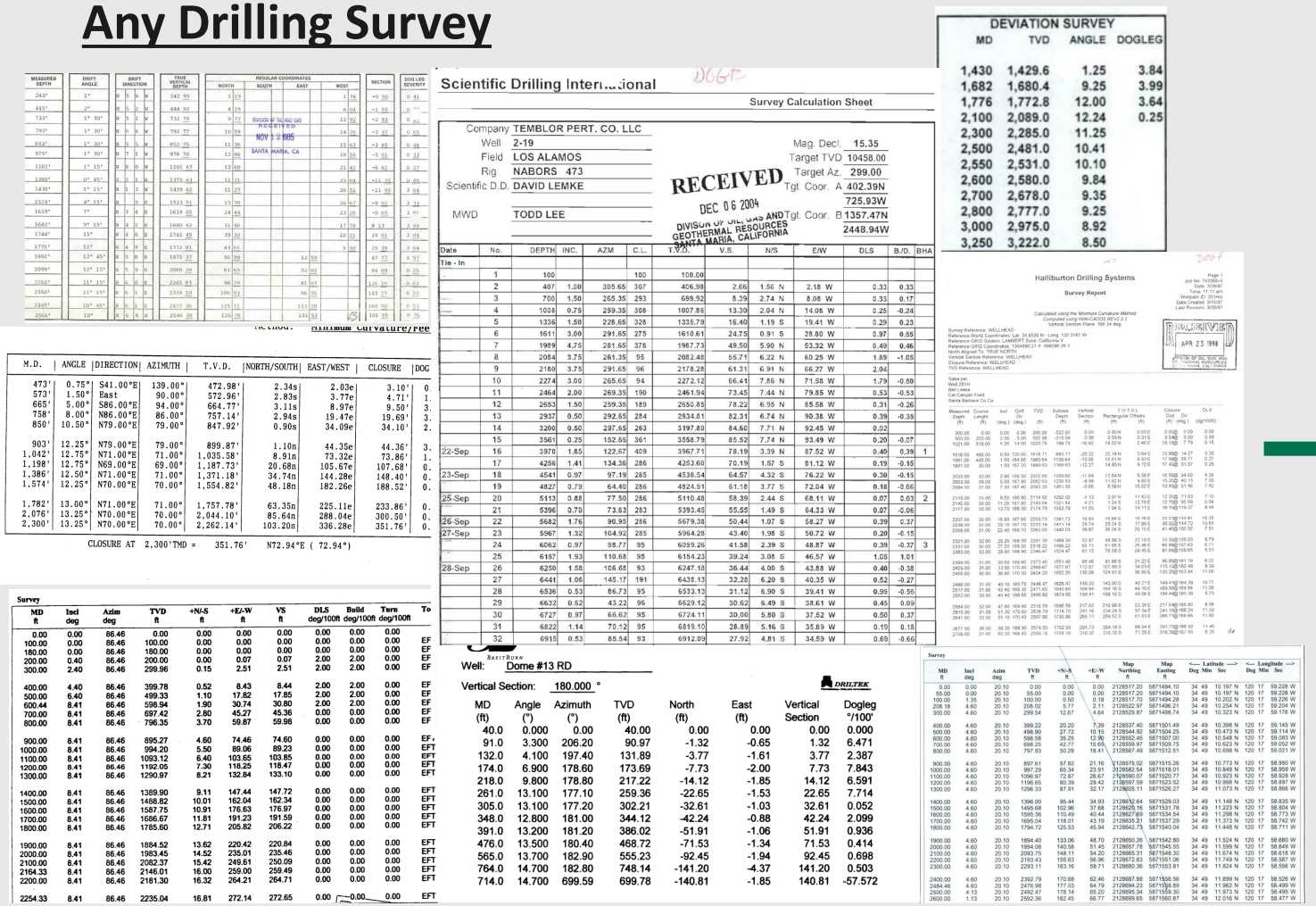
- Which wells will be P&A'd when?

P&A Cost Prediction

- Historical P&A costs are hard to find, especially on a single-well basis
- Some of the highest cost factors cannot be predicted
- Some factors that can be predicted are not tracked in common databases (Enverus)
- Relevant data often exists in messy pdfs

Gravity Energy Storage: Why are wells challenging? Site Selection

Any Drilling Survey



DEVIATION SURVEY

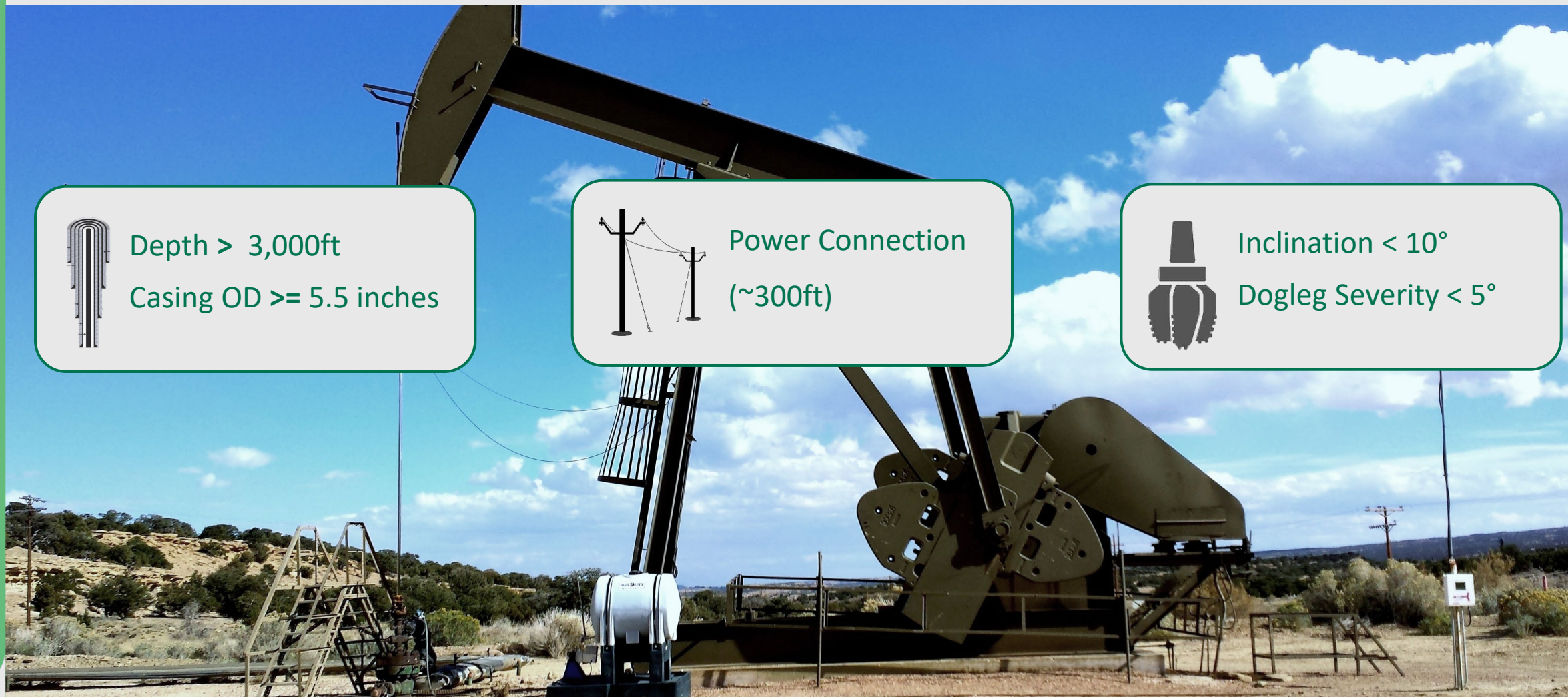
MD	TVD	ANGLE	DOGLEG
1,430	1,429.6	1.25	3.84
1,682	1,680.4	9.25	3.99
1,776	1,772.8	12.00	3.64
2,100	2,089.0	12.24	0.25
2,300	2,285.0	11.25	
2,500	2,481.0	10.41	
2,550	2,531.0	10.10	
2,600	2,580.0	9.84	
2,700	2,678.0	9.35	
2,800	2,777.0	9.25	
3,000	2,975.0	8.92	
3,250	3,222.0	8.50	

Query-ready Database

	A	B	C	D	E	F	G	H	I	J
1	tvd	tvd_page_	casing_si	casing_de	casing_pa	perf_depth	perf_page	plug_dept	plug_page	depth_of_
2	1208	4	[5.5, 7.0]	[[0.0, 1106	[4, 4]	[[1044.0, 1	[10, 10]	[1208.0]	[10]	[1106.0, 12
3	1158	26	[10.75, 7.0	[[0.0, 52.0]	[26, 26, 26	[[854.0, 11	[26]	[1155.0]	[26]	[52.0, 837.
4	1469	6	[7.0, 5.0]	[[0.0, 1434	[4, 5]	[]	['wbd_pag	[1319.0]	[4]	[1434.0, 14
5	1280	21	[8.625, 6.6	[[755.0, 12	[22, 25]	[[331.0, 50	['wbd_pag	[520.0]	[22]	[1280.0, 12
6	3310	9	[10.0, 7.0,	[[0.0, 97.0]	[9, 20, 20]	[[2226.0, 2	[20, 20, 20	[3296.0]	[20]	[97.0, 99.0
7	6730	1	[44.0]	[[4760.0, 6	[1]	[[2628.0, 6	[1, 20, 21,	[6720.0]	[1]	[6728.0]
8	3130	27	[8.625, 6.6	[[0.0, 90.0]	[26, 29, 27	[[2689.0, 2	[16, 19, 22	[2853.0]	[27]	[90.0, 2805
9	11508	1	[13.375]	[[11116.0]	[1]	[[8153.0, 9	[1]			[11116.0]
10	8213	6	[20.0, 10.7	[[0.0, 300.(	[10, 10, 10	[[5588.0, 5	[4, 7, 8, 9]	[7908.0]	[8]	[300.0, 823
11	1100	4	[10.75, 8.6	[[314.0, 11	[4, 4]	[[588.0, 76	[4, 8, 10, 1	[1098.0]	[4]	[1100.0, 11
12	3630	10	[10.75, 7.0	[[0.0, 200.(	[28, 28, 28	[[1548.0, 1	[6, 8, 10, 1	[2079.0]	[26]	[200.0, 365
13	1069	41	[6.625]	[[0.0, 1069	[41]	[[818.0, 81	['wbd_pag	[1080.0]	[41]	[1069.0]
14	1088	5	[5.5]	[[0.0, 1087	[4]	[[714.0, 72	[34]	[1077.0]	[5]	[1087.0]
15	9055	3	[7.0]	[[460.0, 51	[3]	[[416.0, 50	[2, 3]	[10.0]	[3]	[510.0]
16	1000	3	[11.75, 10.	[[0.0, 53.0]	[5, 5, 5, 5]	[[687.0, 10	['wbd_page_2']			[53.0, 50.0
17	1610	3	[7.0, 5.5]	[[1318.0, 1	[3, 4]	[[1286.0, 1	[3, 4, 5]	[1276.0]	[4]	[1610.0, 12
18	1410	16	[7.0, 14.0]	[[0.0, 1409	[16, 21]	[[775.0, 81	[3, 7, 8, 13	[1399.0]	[17]	[1409.0, 44
19	8182	12	[13.375, 9.	[[504.0, 50	[12, 12, 12	[[1134.0, 2	[3, 6, 9, 22	[3229.0]	[22]	[504.0, 340
20	834	8	[5.5]	[[0.0, 834.(	[8]	[[258.0, 27	[7, 8, 10, 1	[813.0, 83	[8]	[834.0]
21	995	1	[10.75, 7.0	[[0.0, 80.0]	[1, 1]	[[413.0, 42	['wbd_pag	[725.0]	[1]	[80.0, 850.
22	2051	48	[9.625, 7.0	[[0.0, 1941	[40, 48]	[[1430.0, 1	[4, 7, 9, 10	[1905.0]	[48]	[1941.0, 20
23	1066	1	[7.0, 12.0]	[[0.0, 20.0]	[1, 1]	[[407.0, 43	['wbd_pag	[915.0]	[1]	[20.0, 1065
24	7489	12	[6.0, 7.0]	[[0.0, 7489	[12, 19]	[[717.0, 73	[9, 10, 11,	[1151.0]	[10]	[7489.0, 12
25	1160	9	[7.0]	[[0.0, 1166	[14]	[[941.0, 92	[9]	[1121.0]	[14]	[1166.0]
26	1220	4	[9.625, 7.0	[[626.0, 12	[4, 5]	[[591.0, 63	[6, 11]	[626.0]	[5]	[1220.0, 12
27	2833	20	[8.625, 5.5	[[0.0, 625.(	[22, 20]	[[1180.0, 1	['wbd_pag	[2791.0, 27	[20, 20]	[625.0, 283
28	2820	42	[12.0, 8.62	[[0.0, 50.0]	[42, 42, 42	[[420.0, 42	['wbd_pag	[820.0, 101	[2, 2]	[50.0, 2820
29	857	12	[7.0]	[[338.0, 74	[12]	[[306.0, 31	[4, 5, 8, 12	[829.0]	[12]	[742.0]
30	2615	3	[8.625]	[[0.0, 336.(	[8]	[[2408.0, 2	[3, 5]	[2260.0, 22	[18]	[336.0, 264
31	890	4	[7.0]	[[1.0, 890.(	[4]	[[490.0, 54	[2, 3, 4, 7,	[523.0]	[5]	[890.0]
32	1009	2	[13.375, 8.	[[155.0, 15	[2, 2, 2]	[[498.0, 50	[2, 4, 5]	[403.0]	[4]	[155.0, 898
33	1609	27	[14.0, 7.0,	[[0.0, 20.0]	[27, 27, 27	[[588.0, 65	[27, 27, 27	[558.0, 812	[27, 27]	[20.0, 1608
34	1160	8	[14.0]	[[0.0, 1159	[8]	[[483.0, 50	[3, 4, 5]			[1159.0]
35	1528	3	[8.625, 6.6	[[0.0, 1152	[2, 4]	[[1152.0, 1	[2, 4]	[1468.0]	[3]	[1152.0, 14
36	1107.14	8	[14.0, 8.62	[[32.0, 100	[4, 5]	[[860.0, 87	[4, 5]			[100.0, 112
37	1332	3	[10.75, 9.8	[[50.0, 133	[2, 3]	[[1332.0, 1	[3]	[450.0, 926	[3, 4]	[1332.0, 13

What makes a well suitable?

There are 9 suitability criteria required for a Gravity Well, the most important are:



Depth > 3,000ft

Casing OD >= 5.5 inches

Power Connection

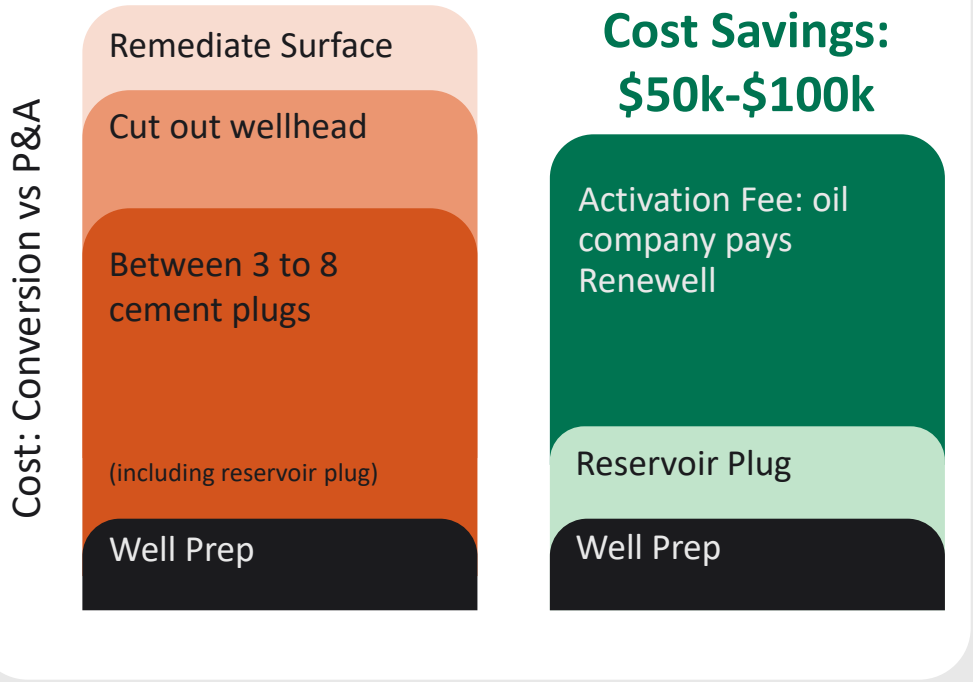
(~300ft)

Inclination < 10°

Dogleg Severity < 5°

Lower Cost Clean-Up

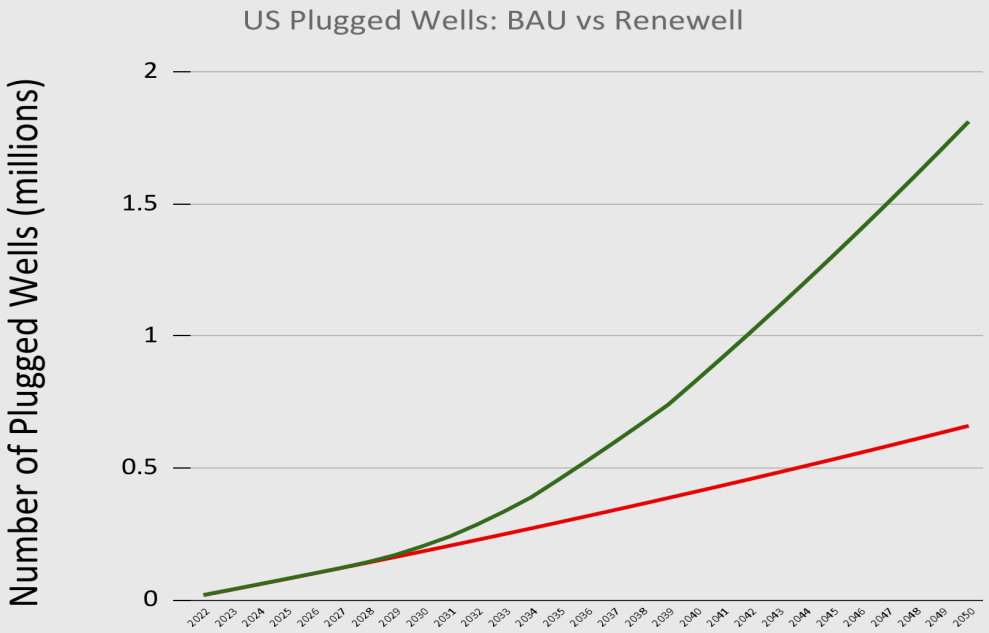
1) Seal the well
2) Install clean energy storage
3) Monitor well bore
4) Improve Net Present Value of Asset



Impact Potential

IMPACT: IDLE WELLS & CARBON EMISSIONS

1.2 million more wells plugged by 2050



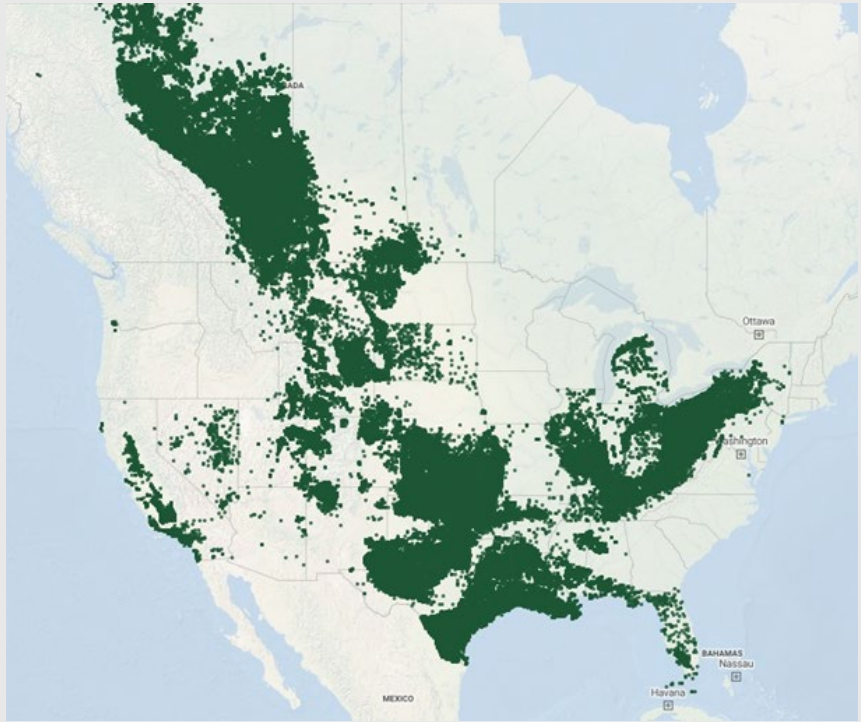
RENEWELL vs **Business as Usual**

O.35 gigatons of CO_2e/ yr mitigated

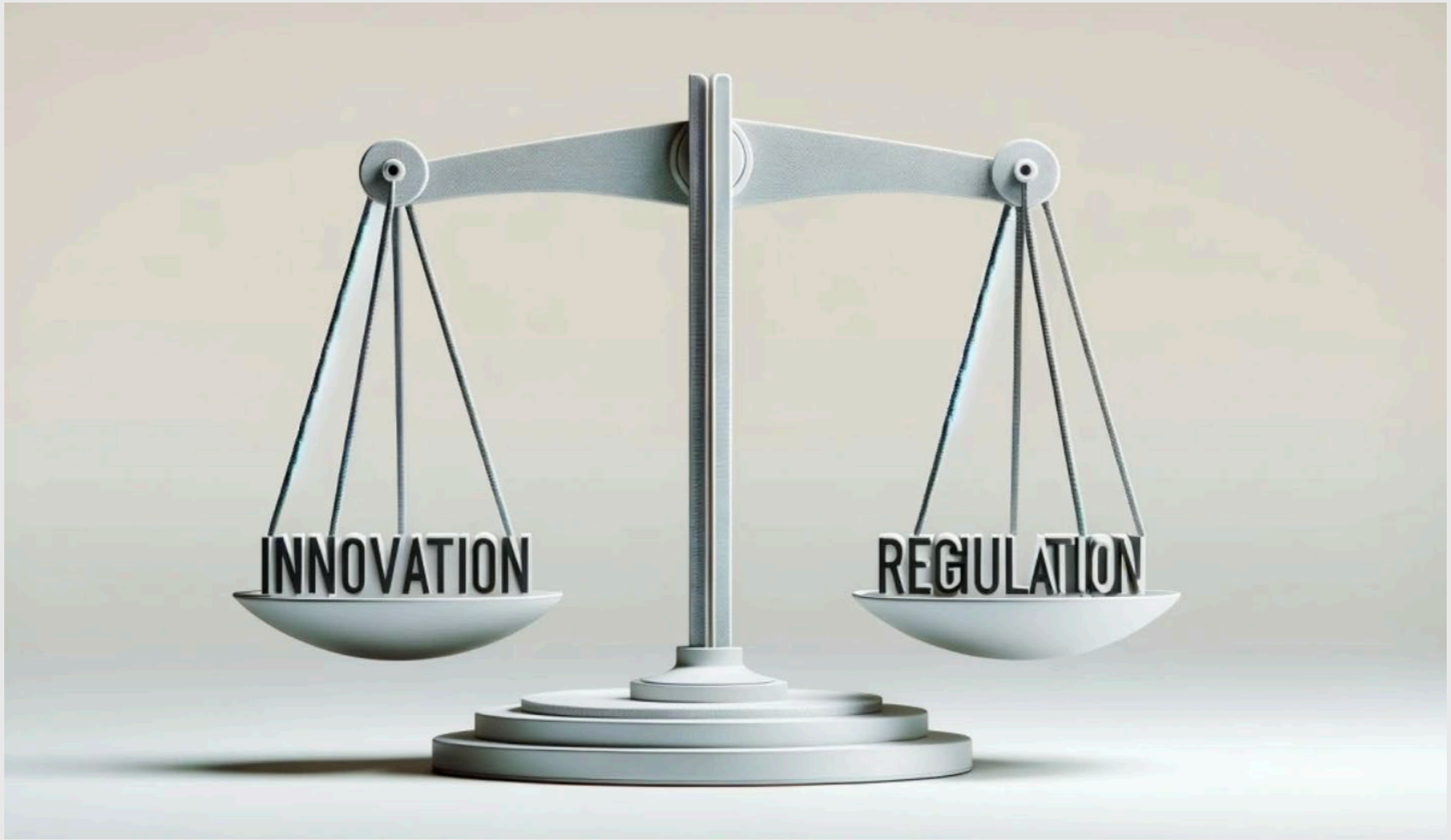
IMPACT: ENERGY STORAGE DEPLOYMENT

Estimated resource: 132 GW

- 1/10th of US need



What is needed for this technology to succeed?



Repurposing and Regulations

Regulatory Challenges

- Repurposing is novel idea
- Not contemplated in existing regulations
- No incentive for operators to convert if they can’t defer P&A

Renewell’s Progress

- P&A regulations analyzed
- Direct conversations with regulators in multiple states
- Pursuing legislative and regulatory changes where it makes sense

Regulations Needed

- Clear and comprehensive definition of well repurposing
- Conversion counts towards annual P&A requirement or well removed from plugging list
- Ensures environmental protection
- Final decommission obligations considered

Colorado Example

The Colorado 400 series has a “beneficial use” clause that is workable for repurposing.

(9) Transferring an Out of Service Well or Repurposing an Out of Service Well for Beneficial Use.

A. If a Selling Operator transfers an Out of Service Well, the Buying Operator assumes the obligations for the Well under this Rule 434.d, and must Plug and Abandon the Well or repurpose the Well for a beneficial use other than hydrocarbon production based on the Selling Operator's timeline pursuant to Rule 434.d.(4) unless the Buying Operator files, and the Director approves, a Revised Form 6A with an alternative timeline for the Buying Operator.

B. An Operator may repurpose an Out of Service Well on its Plugging List for a beneficial use other than hydrocarbon production, subject to the Director's written approval of a Revised Form 6A.

(6) Removal from Plugging List. A Well is removed from an Operator's Plugging List:

i. If an Out of Service Well is transferred to a Buying Operator's Plugging List or repurposed for beneficial use pursuant to Rule 434.d.(9); or

ii. Following the Director's approval of the Well's Form 6, Well Abandonment Report – Subsequent Report of Abandonment pursuant to Rule 435.b.(2). The removal of a Well from an Operator's Plugging List does not relieve an

California – SB 1433

Renewell supported legislation in CA this year that would have created a pilot program for gravity-based energy storage technologies.

LEGISLATIVE PROGRESS

Senate Natural Resources and Water	✅
Senate Environmental Quality	✅
Senate Appropriations	✅
Senate Floor	✅
Assembly Natural Resources	✅
Assembly Appropriations	✖
Assembly Floor	◎

Meet the Team

Kemp Gregory
CEO

Shell: Engineer 5 years
UT-Austin, BS in Mech. Eng.
Stanford, MS in Sustainability

Aaron Muñoz
Lead Mechatronic Engineer

16 years of electrical and mechanical design
USF BS, MS, MBA

Thomas Chant
Lead Data Scientist

3 years of data science & ML
Un. New Hampshire, BS in Math CO School of Mines, MS in Data

Stefan Streckfus
CTO

Burger King: Engineer 6 years
Duke, BS in Mechanical Eng
Stanford, MS in Sustainability

Sarah Douglas
Mechanical Systems Engineer

4 years of mechanical design and risk analysis, UCLA, BS in Mechanical Engineering

Evan Taranta
Director of Government Affairs

14 years of federal & state policy experience
Duke, BS in Political Science

Zach Wenrick
Lead Electrical Engineer

7 years of grid integration & hardware design
UC Boulder, BS in Electrical Engineering

Notable Advisory Board Members

Ex-CTO at Stem Energy
Larsh Johnson

Executive Mentor, 5x Founder
Steve Schramm

Ex-CEO at Aera Energy
Christina Sistrunk

Fractional CTO, AI Strategy
James Taylor

Team Delivers Fast Hardware Development

2020: Founded

2021: Build Prototype

2022: Texas Pilot w/ Prototype

2023: California Pilot w/ Prototype

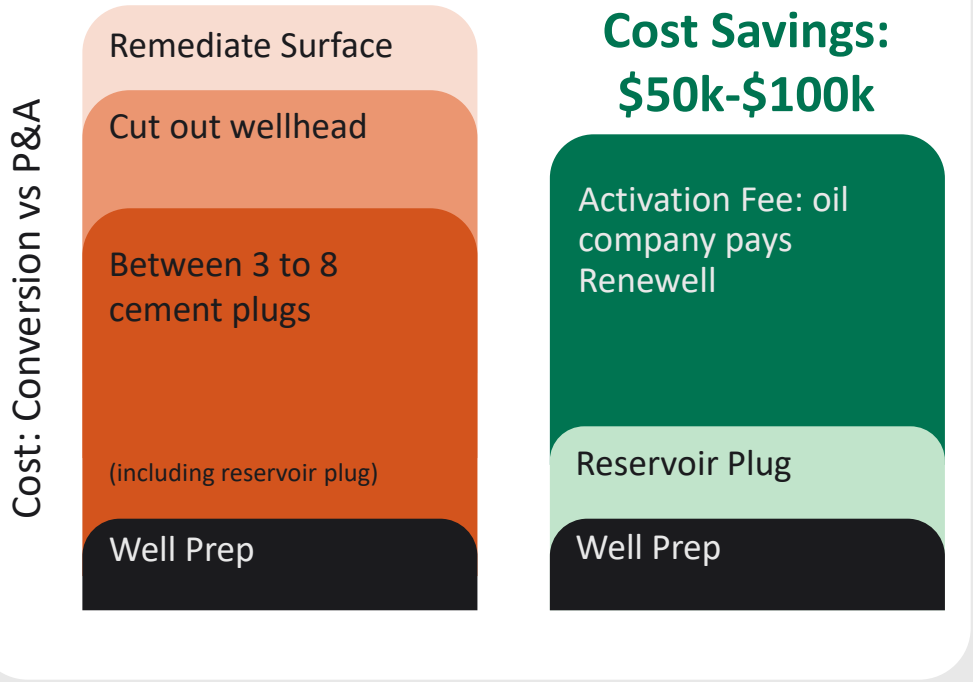
Weight = 3,000 lbs
Power = 5 kW
Energy = 1.67 kWh

2024: First Commercial Device

Weight = 30,000 lbs
Power = 36 kW
Energy = 36 kWh

Lower Cost Clean-Up

1) Seal the well
2) Install clean energy storage
3) Monitor well bore
4) Improve Net Present Value of Asset



Our Vision

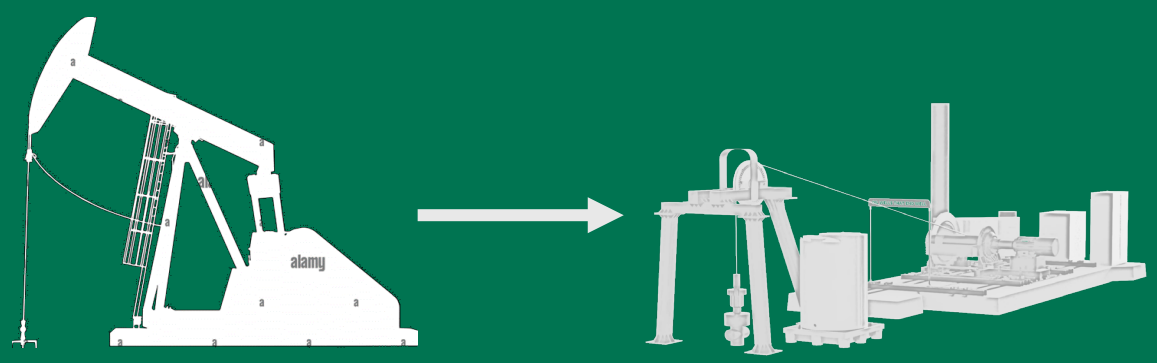
Rather than spending hundreds of billions of dollars to tear out this infrastructure, let’s use those funds to create a massive resource for our evolving energy needs.

Thank you!

Stefan Streckfus: stefan@renewellenergy.com

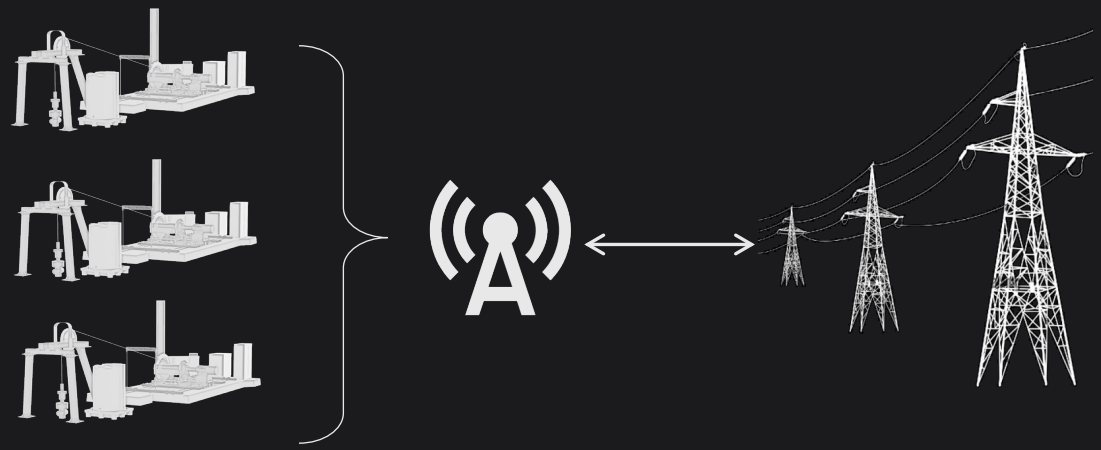
One Solution for 2 Problems = 2 Revenues

1. Activation Fee



Renewell charges the oil company to convert their idle well, receiving the payment in year zero.

2. Energy Storage Services



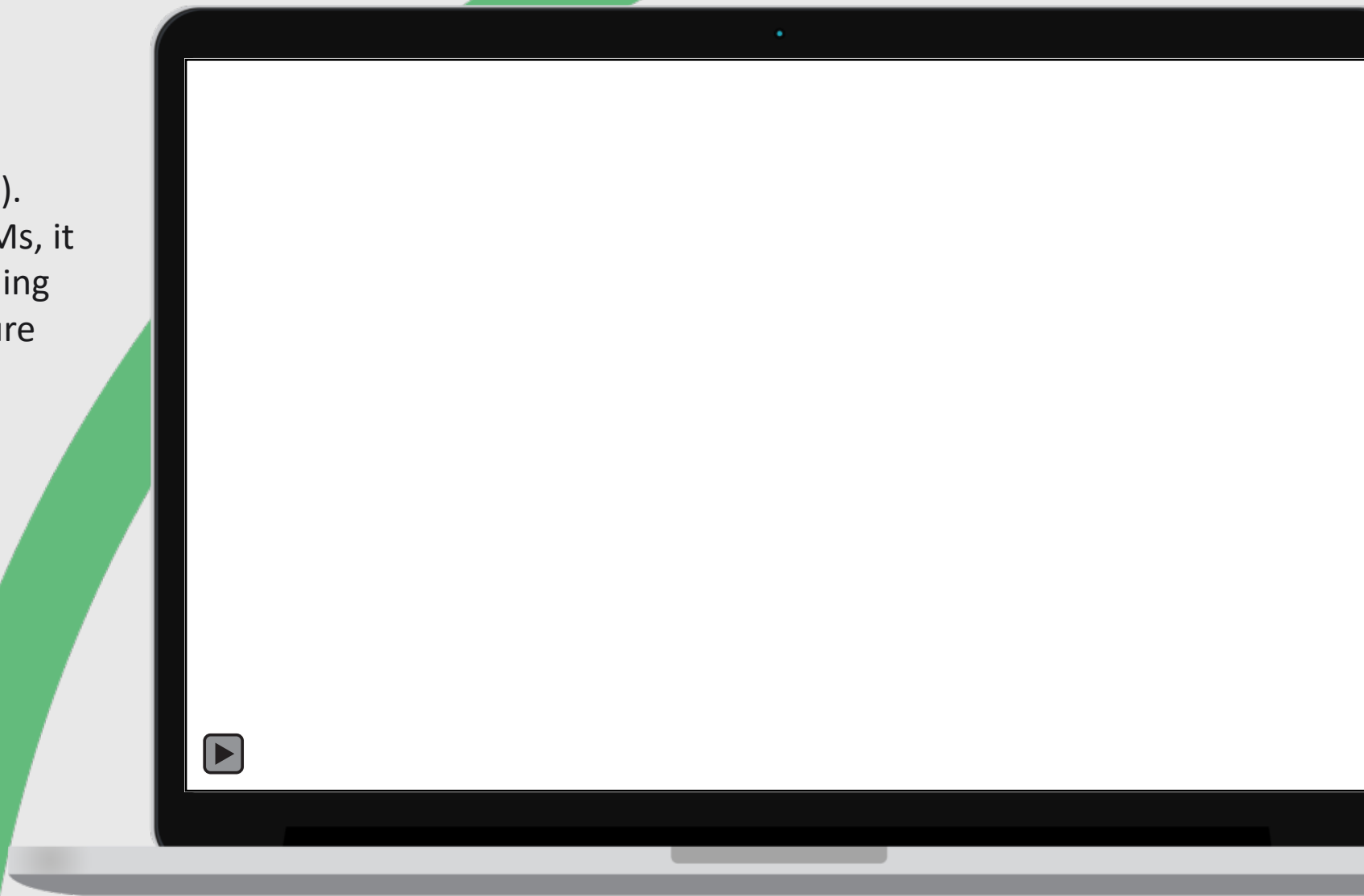
Renewell provides flexible duration (1-100hrs) to the utility, all at the same roundtrip efficiency (70%).

One more revenue stream: Sourcing-as-a-Service

Renewell will commercialize our proprietary database called the Suitable Well Finder Tool (“SWFT”). Using the latest OCR tools and LLMs, it is designed to coordinate the coming mega-trend of energy infrastructure repurposing.

Which wells are best for?

- Gravity Well
- Other future products
- Geothermal
- CCS / Bio-oil
- CAES
- Hydrogen



Must Have: Regulatory Clarity

California

- Running a bill
- Will create 10-year pilot program
- Passed through 3 senate committees, senate floor, and first assembly committee
- **Will establish new well designation and unlock Activation Fee**

Colorado

- Using existing code
- Regulator has greenlighted Renewell to explore never-used-before designation – “Beneficial Use”
- Talking to O&G companies to move through new process
  - Chevron, Oxy, Civitas
- **Will remove wells from plugging list, unlocks Activation Fee**

Additional value to customers


Tax credits


Carbon credits


Reduce CO_2e/bbl


Sustainability goals


PR opportunity


Reduce ARO

6 Step Process

Standard Process

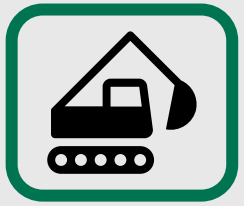
1. Align on project objectives

2. Screen wells for viability

3. Assess project potential

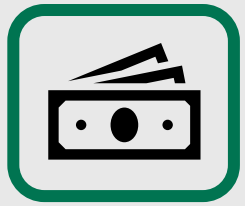
4. Contract execution

5. State P&A obligation approval



6. Construct Gravity Wells

Additional Value Potential



Sell Carbon Credits

P&L ARO Reduction

PR

Better than a battery

Technology	Projected 2030 capital cost ($/kWh)
Vanadium flow	$447
Li-ion - High	$250
Li-ion - Medium	$200
Li-ion - Low	$145
Gravity Well	$5

- Environmental impact is Net Negative CO_2e
- Round Trip Efficiency matches Li-ion & pumped-hydro
- Flexible output means widest array of services

What happens after 30 years?

An independent insurance policy pays for the remaining P&A.

How it would work:

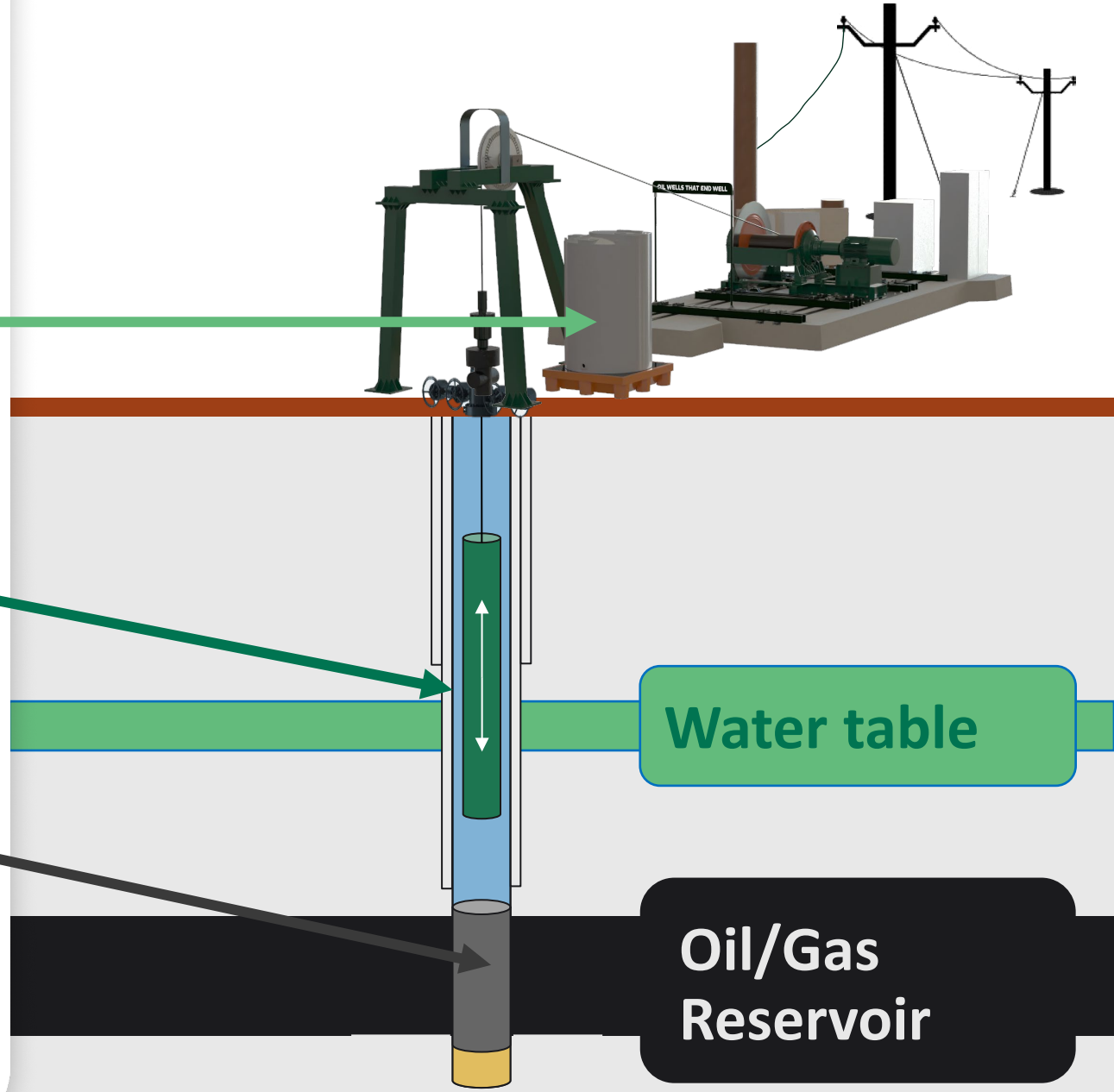
- One time premium = PV of remaining future P&A cost
- Mimics an existing well specific and individual insurance product
- In place of bonding
- Also covers required surface reclamation
- Work carried out by current operator or Renewell

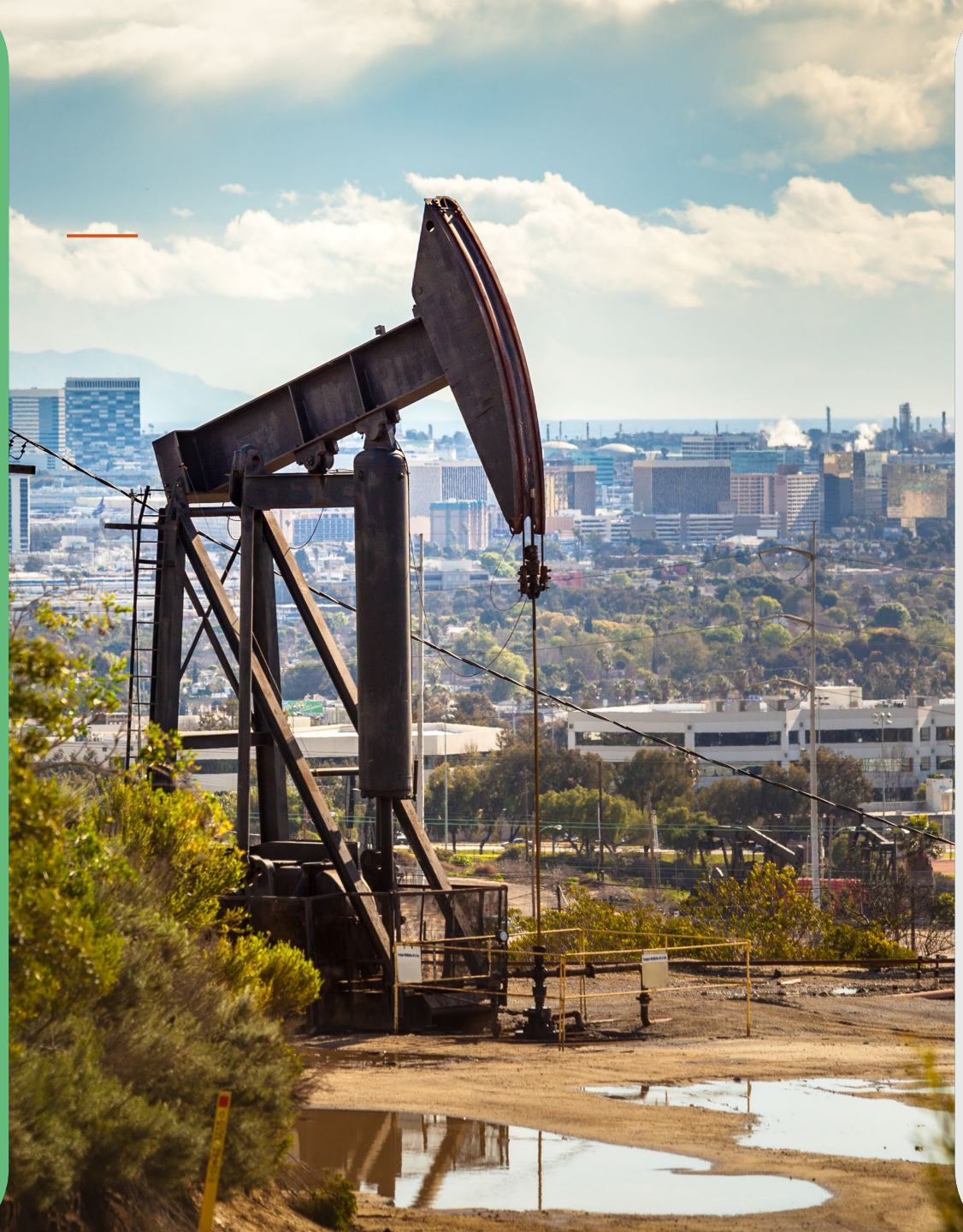
Gravity Well: 2-in-1 Solution

We monitor the well for methane leaks and mechanical integrity

Weight moves up and down inside the well, converting potential energy to electrical energy

The well is plugged to prevent any interaction with the reservoir or methane leakage





Commercial progress

Product Partnerships

NREL
NATIONAL RENEWABLE ENERGY LABORATORY

PCD WORKS

HAX

CERTEX

TWG
a DOVER company

Growth Partnerships

Stanford | ENERGY
Stanford Climate Ventures

EPRI
ELECTRIC POWER RESEARCH INSTITUTE

BLUETECH VALLEY

RICE

StartX

THIRD DERIVATIVE

Why adopt early?

01

Immediate Savings

02

P&A liability is increasing rapidly

03

PR halo

04

Lead the industry

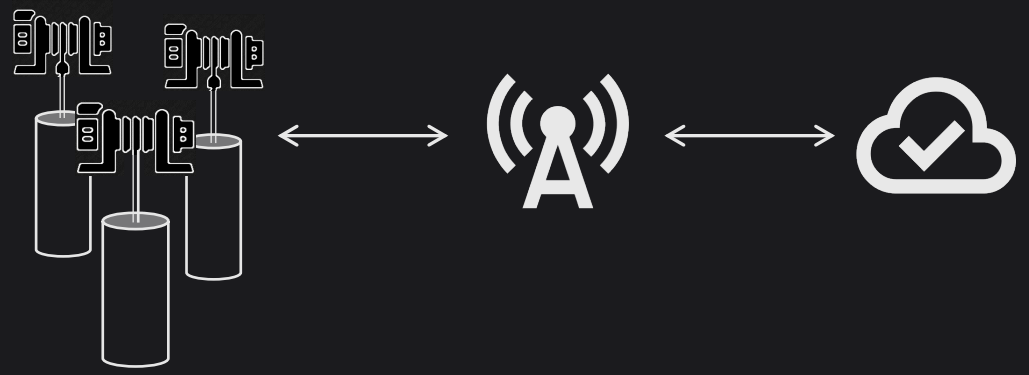
Who cares?

Optimized Energy Storage Revenue

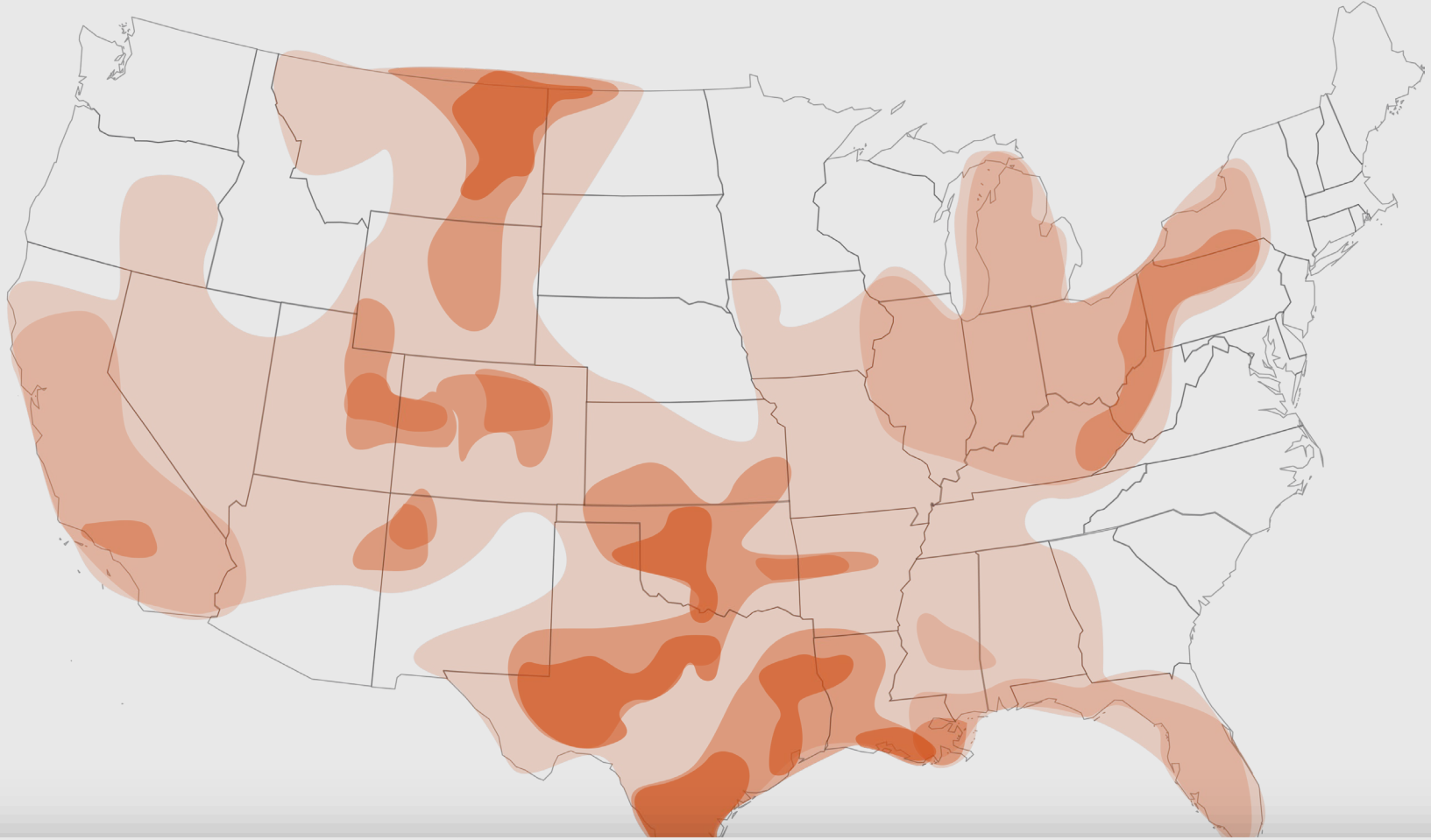
1. Utility bill reduction

Renewell arbitrages power prices on behalf of the host oil and gas company

2. Virtual powerplant

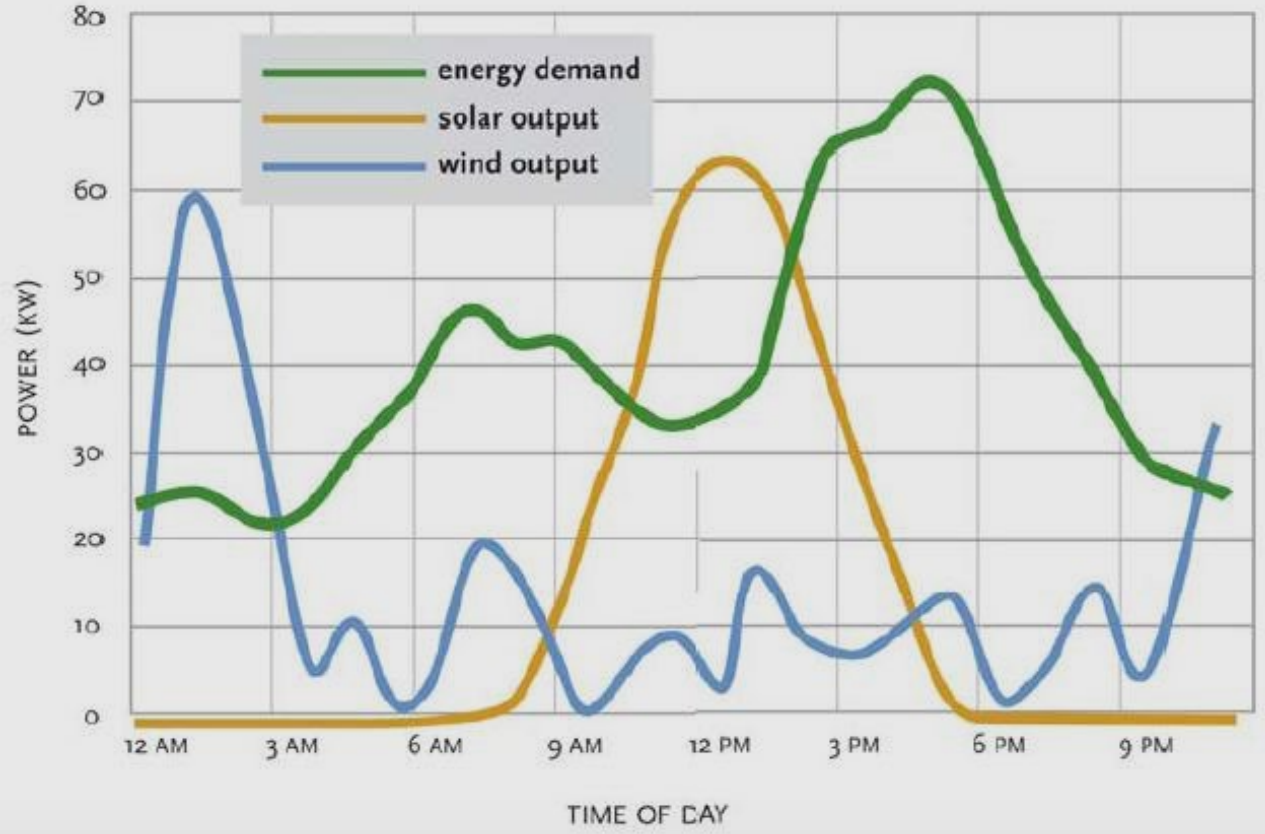


Renewell aggregates wells remotely and collectively to provide services to the local grid



5.1 million

Oil and gas wells will cost $400 billion to cleaned up in North America.



Supply ≠ Demand

Because solar and wind supply does not equal demand, the U.S. will need to increase current energy storage capacity by 10x.

$1.3 billion

is the average annual spend by oil and gas companies on 'plug and abandonment'. This expenditure is for 20,000 idle wells in the US.

Assumes $70k per well. Number of wells P&A'd/yr source is the IOGCC. Total future cost only accounts for today's inactive, orphan, active wells (will become inactive), and not any wells yet to be drilled.