DEEP EARTH ENERGY PRODUCTION GEOTHERMAL POWER PROJECT

JANUARY 2021

DISCLAIMER

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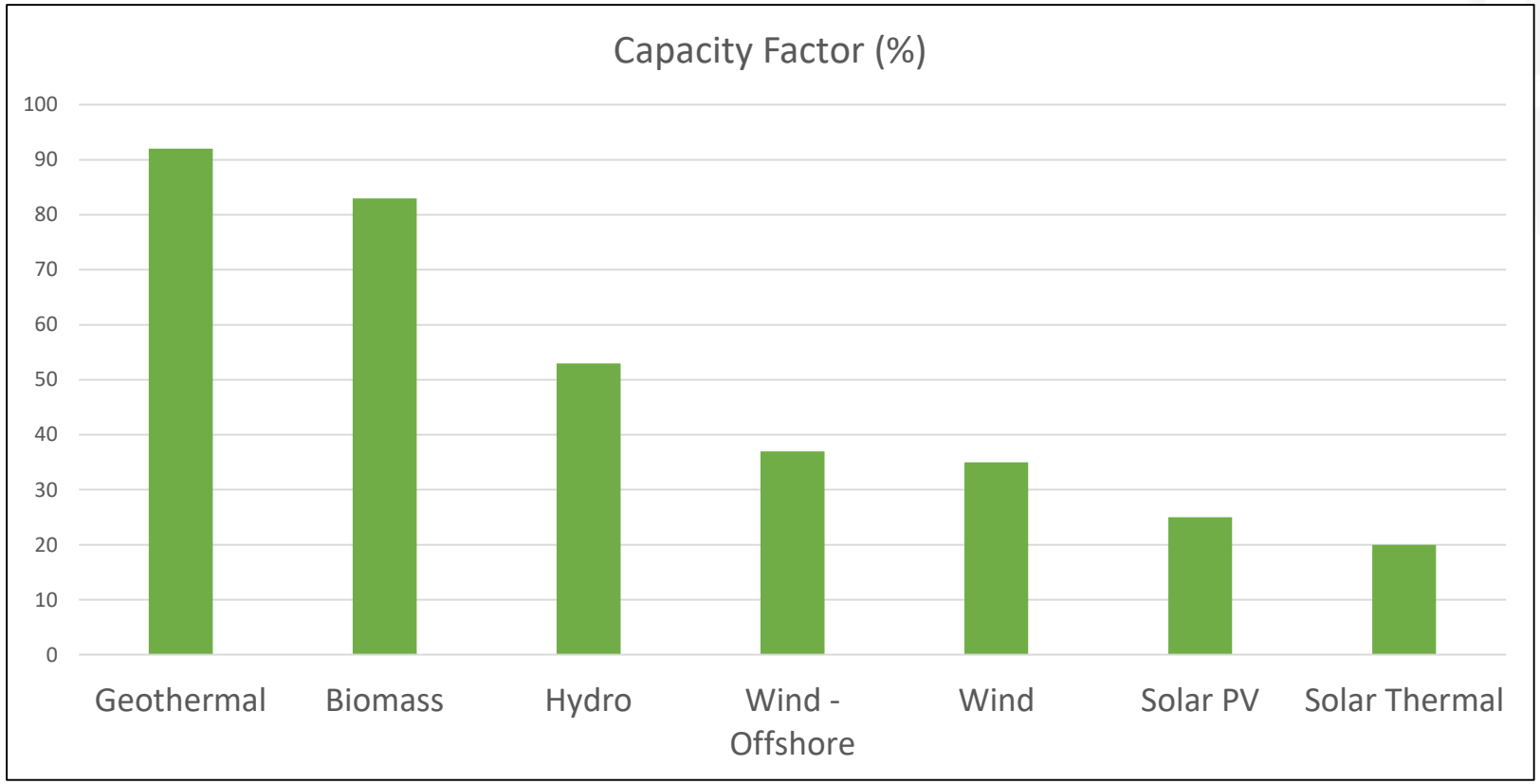
BACKGROUND

GEOTHERMAL BENEFITS

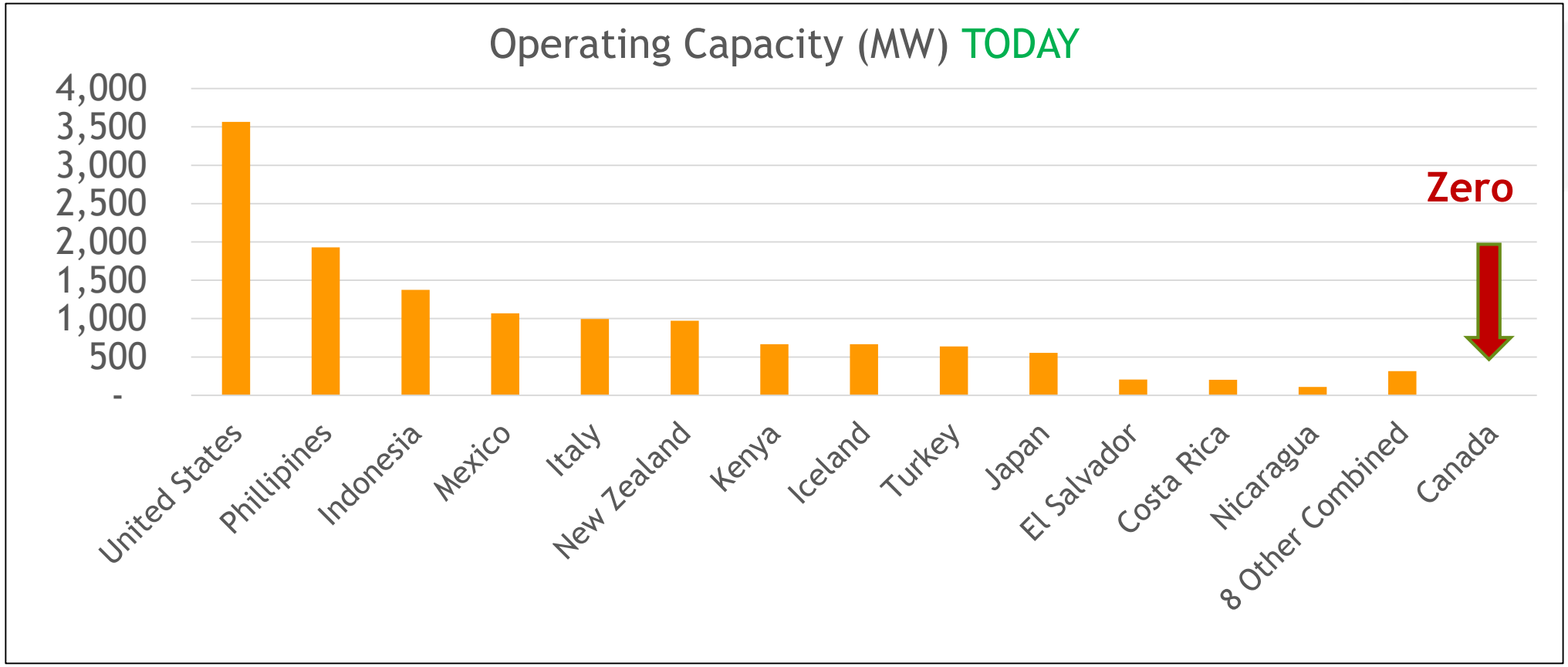
- Geothermal has **zero CO2 emissions**
- **Smallest environmental footprint** of the renewables (one 20MW ~ = football field)
- Low noise
- No animal migration disruption or bird mortality
- Low operating costs
- Reliable

BASELOAD CAPACITY



- Geothermal's big added value is that it's the only renewable to produce BASELOAD power with 95% availability

CANADA LAGS IN GEOTHERMAL - A SUCCESSFUL PROJECT WOULD OPEN THE DOOR TO A BRAND NEW CANADIAN CLEAN ENERGY INDUSTRY



Global geothermal capacity reaches 14,900 MW

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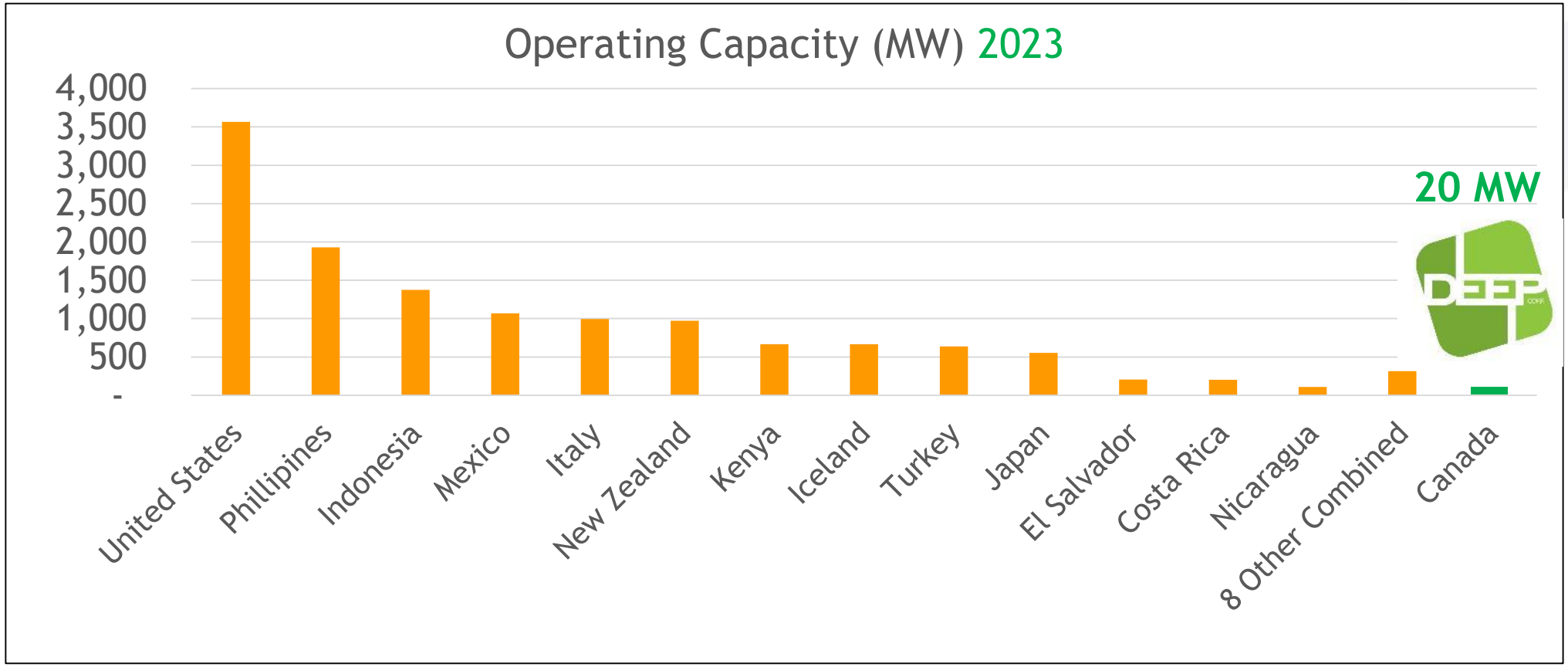


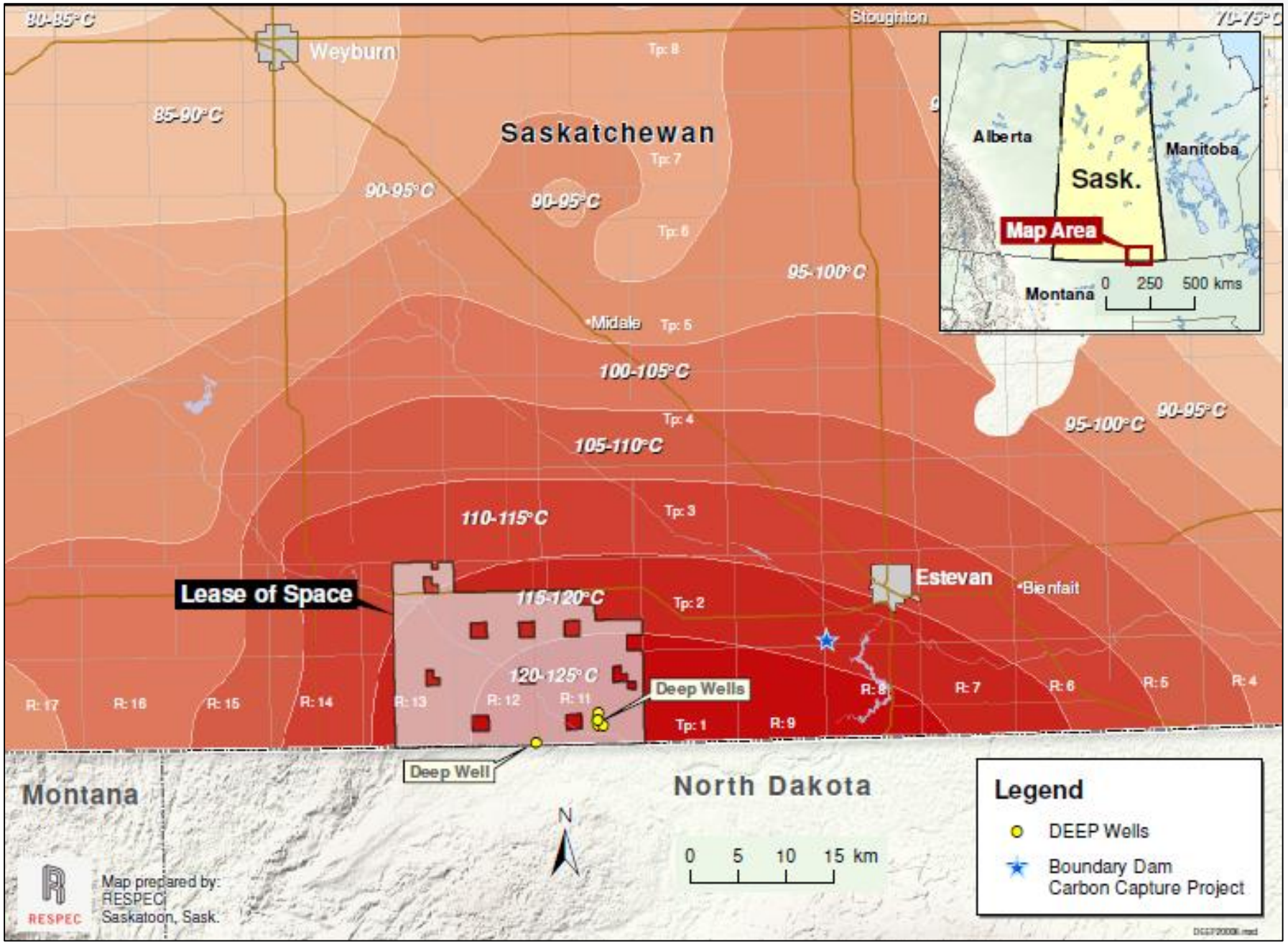
Global geothermal capacity reaches 14,900 MW

WHY SASKATCHEWAN? WHY NOW?

- Hot water in the Williston Basin has historically been considered an **oilfield operational cost** versus a valuable resource
- We wouldn't even know this geothermal resource existed if it weren't for the oil and gas industry drilling into it
- Geothermal is part of the increased requirement for renewables, in Canada's goal for **net zero emissions**

Iceland Strokkur geyser

DEEP's drilling location, south of Torquay, SK


80-85°C
Weyburn
Stoughton
70-75°C
Tp: 8
85-90°C
Saskatchewan
Tp: 7
90-95°C
90-95°C
Tp: 6
95-100°C
Midale
Tp: 5
100-105°C
Tp: 4
105-110°C
95-100°C
90-95°C
110-115°C
Tp: 3
Lease of Space
115-120°C
Tp: 2
Estevan
Bienfait
120-125°C
Deep Wells
R: 17
R: 16
R: 15
R: 14
R: 13
R: 12
R: 11
R: 8
R: 7
R: 6
R: 5
R: 4
Tp: 1
R: 9
Deep Well
Montana
North Dakota
N
0 5 10 15 km
Map prepared by:
RESPEC
Saskatoon, Sask.
Legend
DEEP Wells
Boundary Dam
Carbon Capture Project
Alberta
Manitoba
Sask.
Map Area
Montana
0 250 500 kms

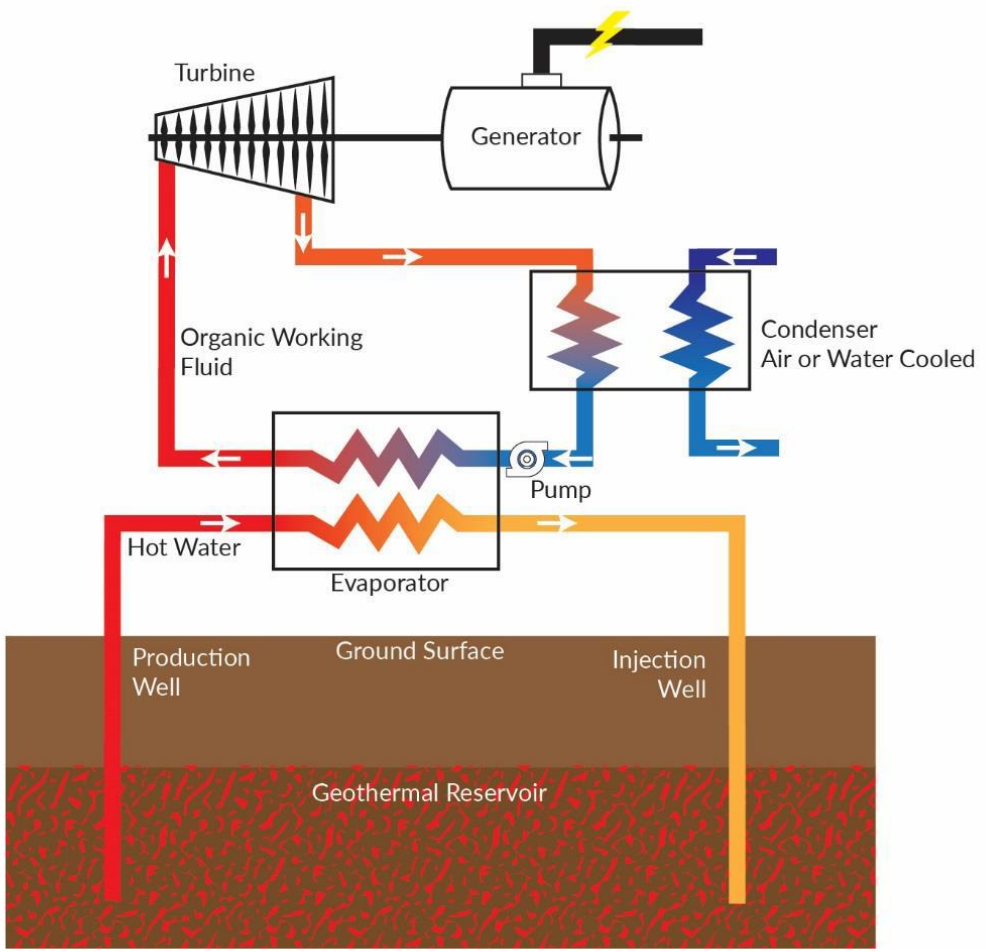
A MADE-IN-SASKATCHEWAN ENERGY OPPORTUNITY

- Highly **supportive and streamlined regulatory environment** thanks to 60 years of oil and gas development and mining operations (incl. uranium!)
- Using Canada's **world class oil and gas technology and expertise** – unleashed for the first time on renewable energy
- In line with Sask Builds Government Procurement Policy, employing 100s of Saskatchewan contractors
- Open to collaboration with First Nations

POWER PURCHASE AGREEMENT "PPA"

- First geothermal Power Purchase Agreement contract in Canada, announced May 16, 2017
- Supports SaskPower's goal to reduce emissions from 2005 levels by 40% by 2030

POWER GENERATION TECHNOLOGY – ORGANIC RANKINE CYCLE (ORC)



- Proven technology >40 years of field implementation around the world
- Wells drilled into a geothermal reservoir produce hot water and steam from a depth of up to 3 km
- The geothermal energy is converted at a power plant into electricity
- Hot water and steam are the carriers of the geothermal energy

POWER GENERATION TECHNOLOGY – ORGANIC RANKINE CYCLE (ORC)

- Map of geothermal facilities installed with ORC technology
- ORC power generation is used in any industry that generates heat; paper mills, gas compressor stations, cement factories, gas processing plants, oil and gas refineries, incinerators, chemical plants, etc.

WHAT WE HAVE ACHIEVED IN 2 YEARS

FEDERAL FUNDING ANNOUNCEMENT REGINA CORE LAB, JANUARY 2019

RECENT FUNDING

- **Private Equity** investor investment: **$16,000,000** (last 2 years)
- **Natural Resources Canada**'s Emerging Renewable Power Program: **$27,052,500** contribution agreement
- **Provincial** Funding: Innovation Saskatchewan **$175,000**

Partially Funded by Natural Resources Canada | *Financé partiellement par Ressources naturelles Canada*

SUCCESSFUL FIRST EXPLORATION WELL – JANUARY 2019

- Drilling and validating the resource potential was a huge accomplishment – **a Wildcat Well**!
- The well was completed to a depth of 3,530 metres into a hot (+**125˚C**) aquifer
- Deepest well ever drilled in Saskatchewan
- **$3.72M**

INITIAL RESERVOIR TESTING – SUMMER 2019

- Flow and Build-up test: 3 day 1,500m3 flow and 12 day shut-in
- Injectivity testing
- **$1.25M**

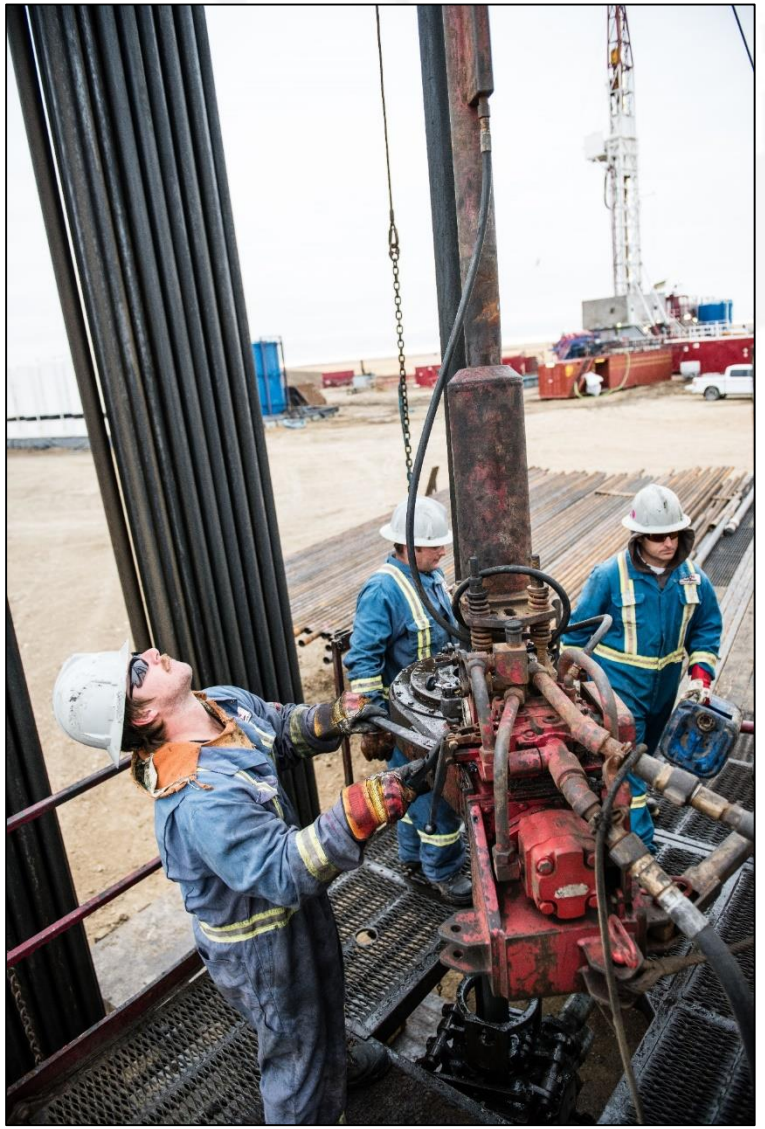
DELINEATION DRILLING – WINTER 2019/2020

- 4 additional test wells completed for geological modelling and to test 3D seismic and airborne magnetic data
- Each well demonstrated **similar and consistent positive results**
- **$13.45M**

FIELD RESERVOIR TESTING – Q2/Q3 2020

Well	Commence	Complete	Days	Tasks
Border-03 Deadwood	2020-05-19	2020-07-27	69	1) Spinner log and injection test with filtered produced brine 2) Run ESP
Border-04 Deadwood	2020-06-17	2020-09-16	91	1) Pump nitrogen, monitor rates and pressures 2) Run bridge plug with poly plug and suspend wellhead
Border-01 Precambrian	2020-06-18	2020-07-16	28	1) Run recorders and Nitrogen lift 2) Flow test 3) Injection test 4) Tubing Conveyed Perforate 5) Pump Nitrogen
Border-01 Deadwood	2020-07-20	2020-07-29	9	1) Bleed of Nitrogen and lay down tubing conveyed perforating guns 2) Run PL spinner log 3) Inject water
Border-03/Border-01 Loop	2020-07-29	2020-09-13	46	1) Produce out of Border-03 with ESP and inject into Border-01

- **$3.23M**

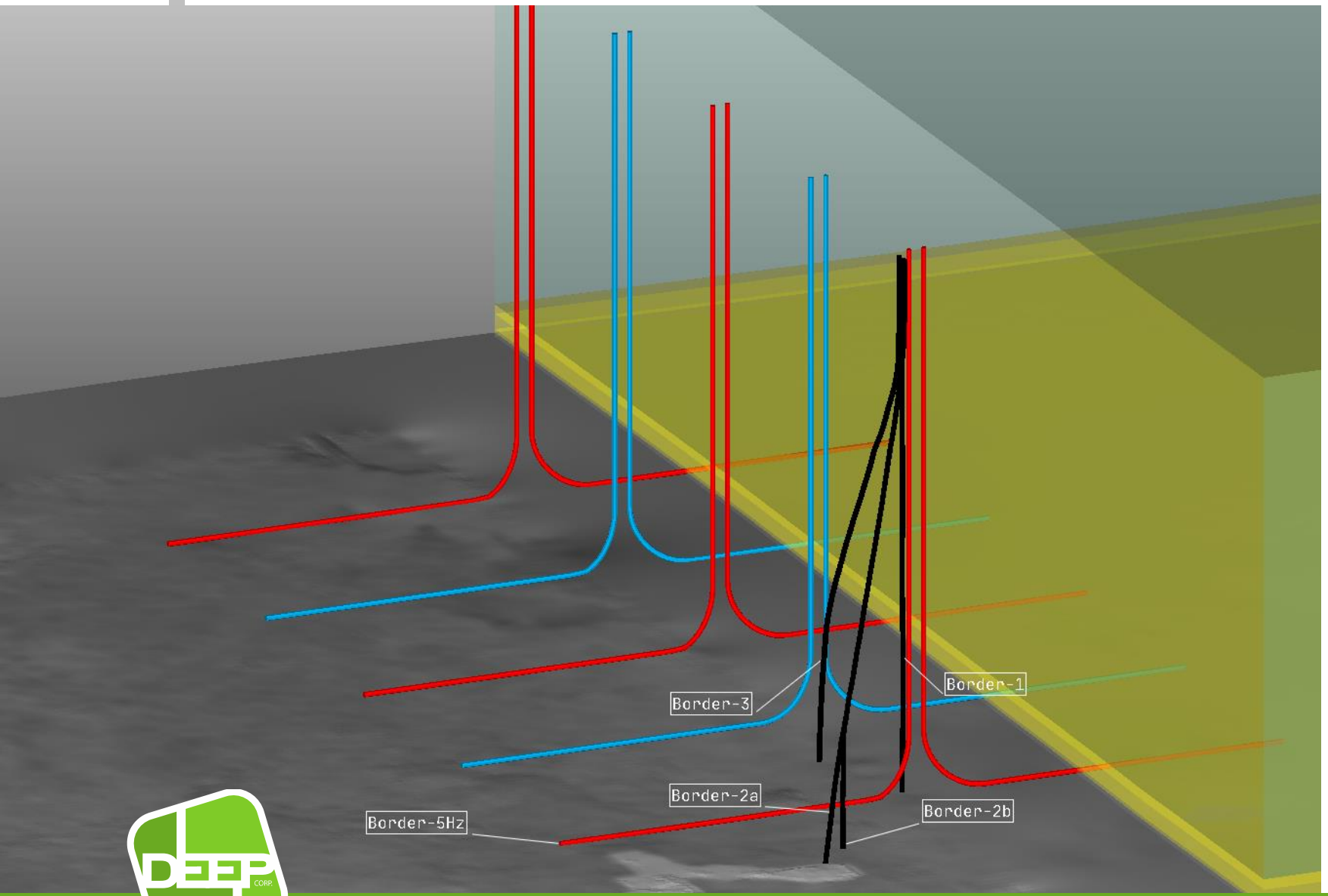


SASKATCHEWAN'S DEEPEST HORIZONTAL WELL – OCTOBER 2020

- The deepest horizontal well in Saskatchewan's history, allowing for the installation of a large volume submersible pump
- Will produce out of this well and inject into nearby vertical wells to conduct a 30-60 day large volume test for reservoir performance data critical to completing the Feasibility engineering
- **$8.52M**
- **Total expenditure from Q4 '18 to Q4 '20 is $30.17M**

NOVEMBER 2, 2020, HORIZONTAL WELL STIMULATION

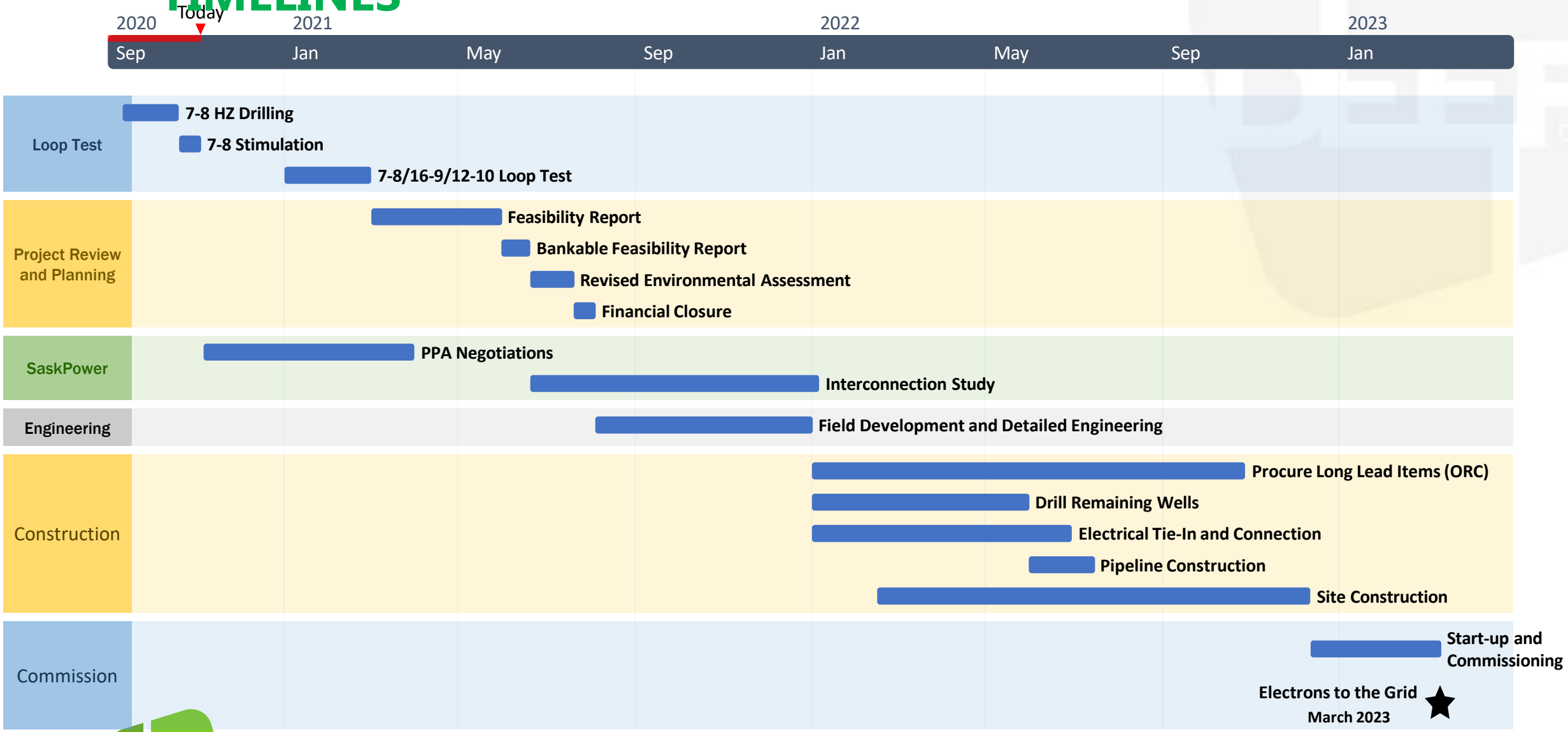
SUBSURFACE FIELD DESIGN OPTIMIZES AT 20MW



- Preliminary subsurface design **optimizes the well spacing and configuration to produce 20 MW** of power
- **6 production** and **4 injection wells**
- Each well will be drilled to a depth of ~3.5 km plus a horizontal length of ~2 km
- The subsurface development area for each 20 MW block measures approximately 5 x 8 km, while the surface disturbance is only approximately 300 x 300 metres

COMPLETION OF FEASIBILITY ENGINEERING

TIMELINES


2020
Today
2021
2022
2023
Sep
Jan
May
Sep
Jan
May
Sep
Jan
Loop Test
7-8 HZ Drilling
7-8 Stimulation
7-8/16-9/12-10 Loop Test
Project Review and Planning
Feasibility Report
Bankable Feasibility Report
Revised Environmental Assessment
Financial Closure
SaskPower
PPA Negotiations
Interconnection Study
Engineering
Field Development and Detailed Engineering
Construction
Procure Long Lead Items (ORC)
Drill Remaining Wells
Electrical Tie-In and Connection
Pipeline Construction
Site Construction
Commission
Start-up and Commissioning
Electrons to the Grid
March 2023

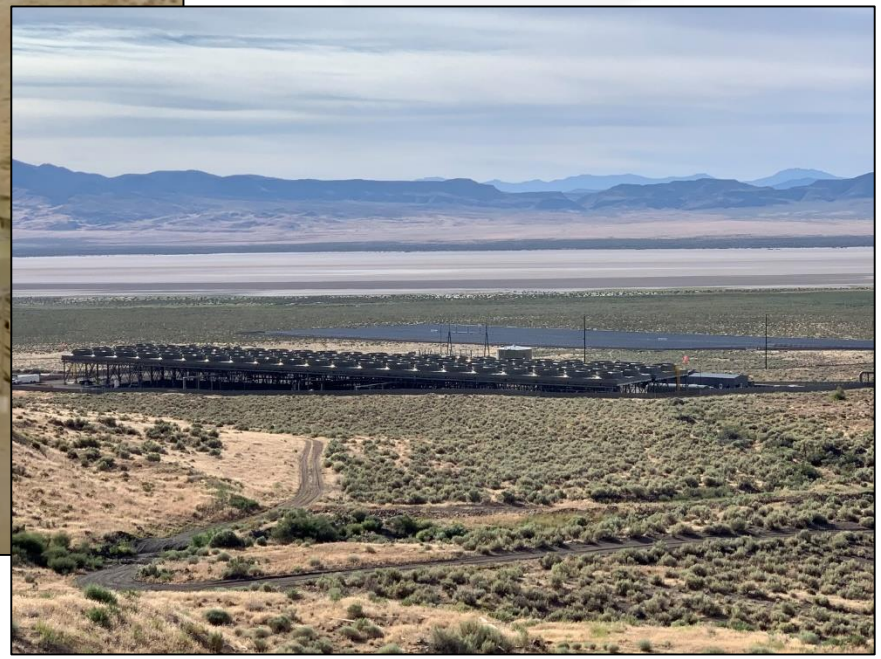
FUTURE

FUTURE BUILD-OUT IS SIGNIFICANT

Courtesy: ORMAT

- The predictable resource supports multiple fields
- DEEP's long term strategy is to build at least **100 MW of clean, baseload power** facilities plus direct/waste heat projects
- DEEP owns the subsurface rights to develop 5 x 20 MW fields
- Will see a significant reduction in resource exploration costs on subsequent fields; expensive learning is behind us

ORMAT ACHIEVED SOLAR + GEOTHERMAL AT THE TUNGSTEN FACILITY IN 2019



https://www.youtube.com/watch?v=9a2g222Dk_c

CLEAN ENERGY TRANSITION

- This first 20 MW field would offset approximately **100,000 metric tonnes of CO_2/year, equal to removing ~31,000 cars off the road annually**
- Utilizing local **world class oilfield drilling expertise**, this project is a first step in Canada's significant energy transition to clean power
- Redeploys a **uniquely skilled workforce** into a new clean energy industry and attract a diverse and innovative labour force

GEOTHERMAL: THE CATALYST FOR A NEW SASKATCHEWAN AGRICULTURE OPPORTUNITY

https://greenportwestholland.nl/en/about/

- In addition to power generation, DEEP's waste heat can heat **massive greenhouses** or other direct heating opportunities
- Major **private and public** sector greenhouses
- Research into diverse high-value crops, to **increase farm profitability**
- Saskatchewan is investing **$4 Billion into irrigation infrastructure** to diversify crop growing options

$1B INDUSTRY FOR SASKATCHEWAN AND CANADA

100 MW of geothermal power and greenhouse development could be a new $1 Billion industry to **stimulate the Southeast Saskatchewan economy and contribute to the province's growth**

EXCITING TIMES ADVANCING THIS WORLD CLASS PROJECT