



DEEP EARTH ENERGY PRODUCTION GEOTHERMAL POWER PROJECT

MARCH 24, 2021

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BACKGROUND

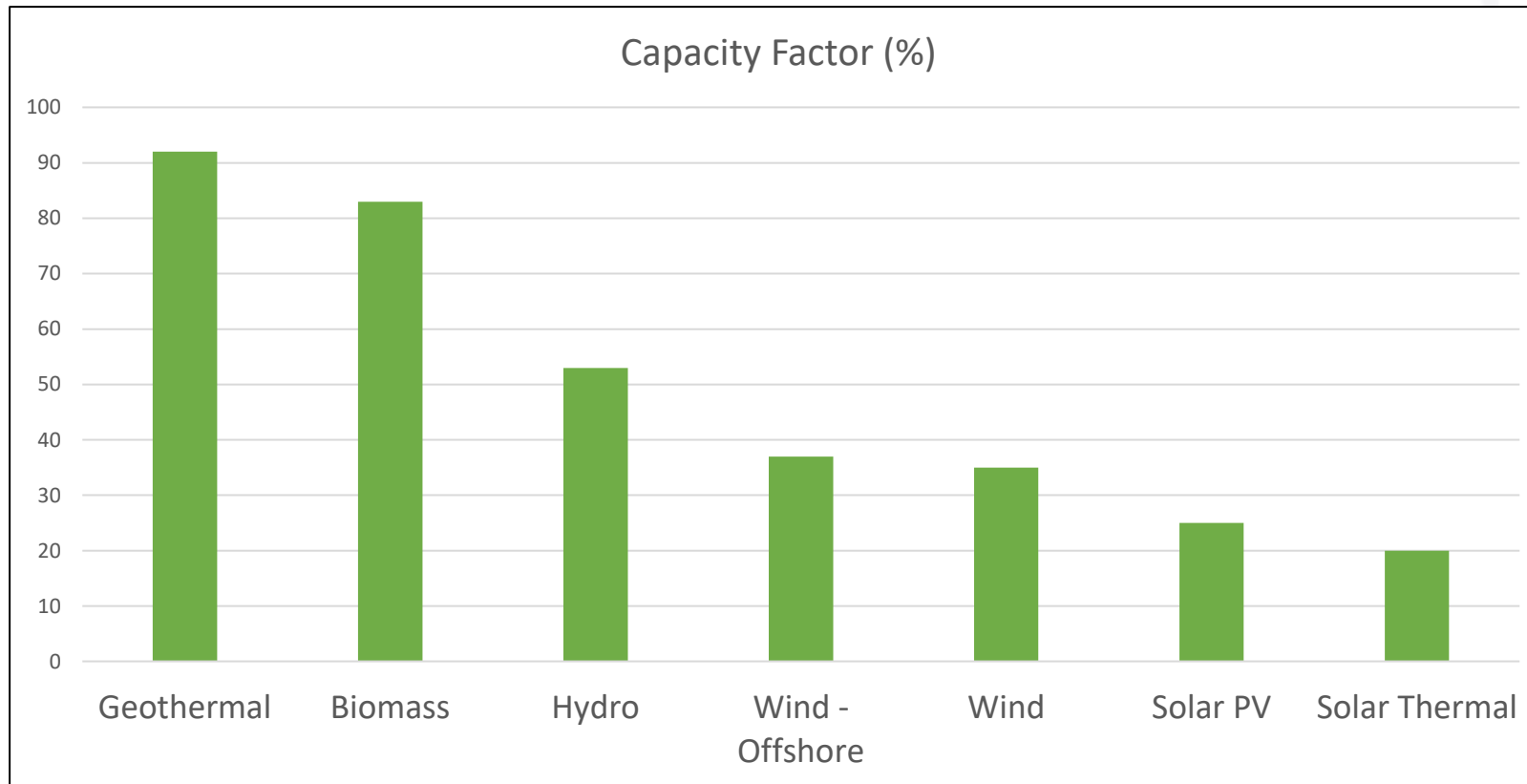
GEOHERMAL BENEFITS



- 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



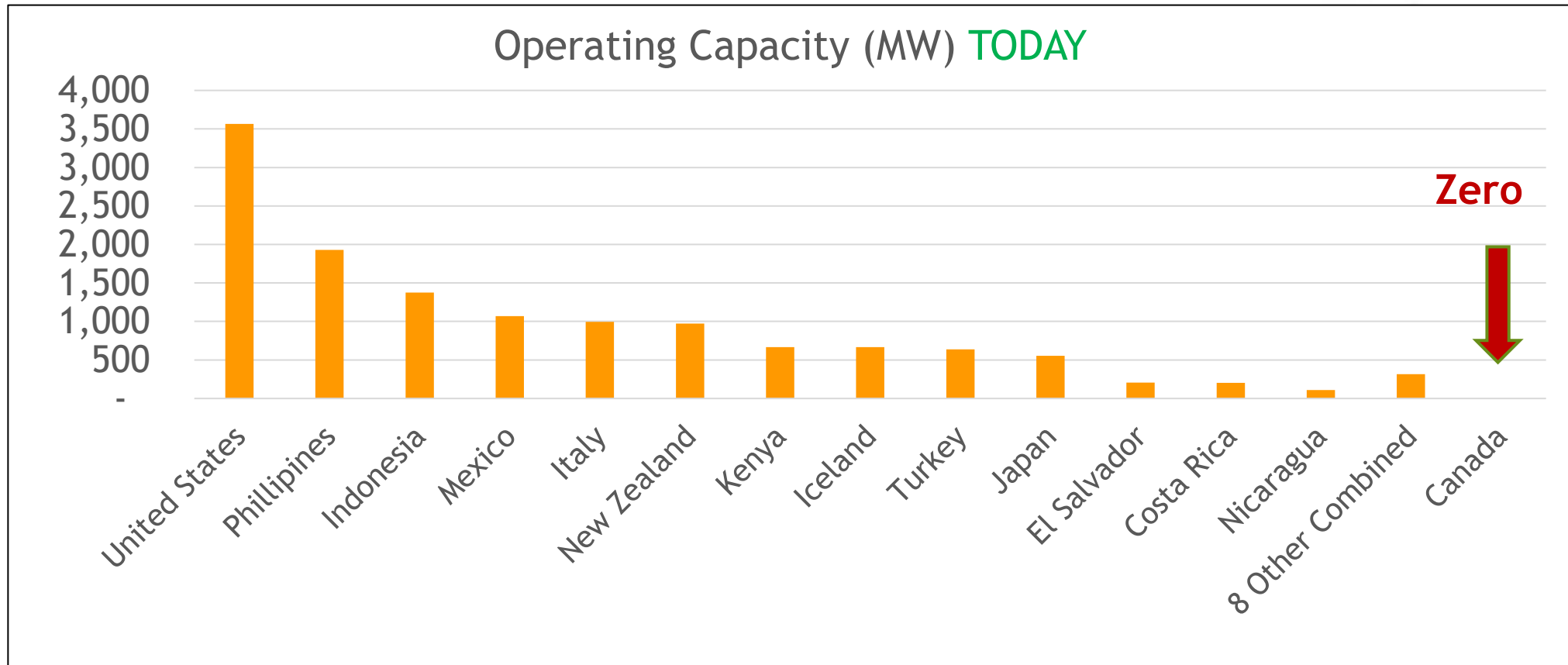
BASELOAD CAPACITY



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



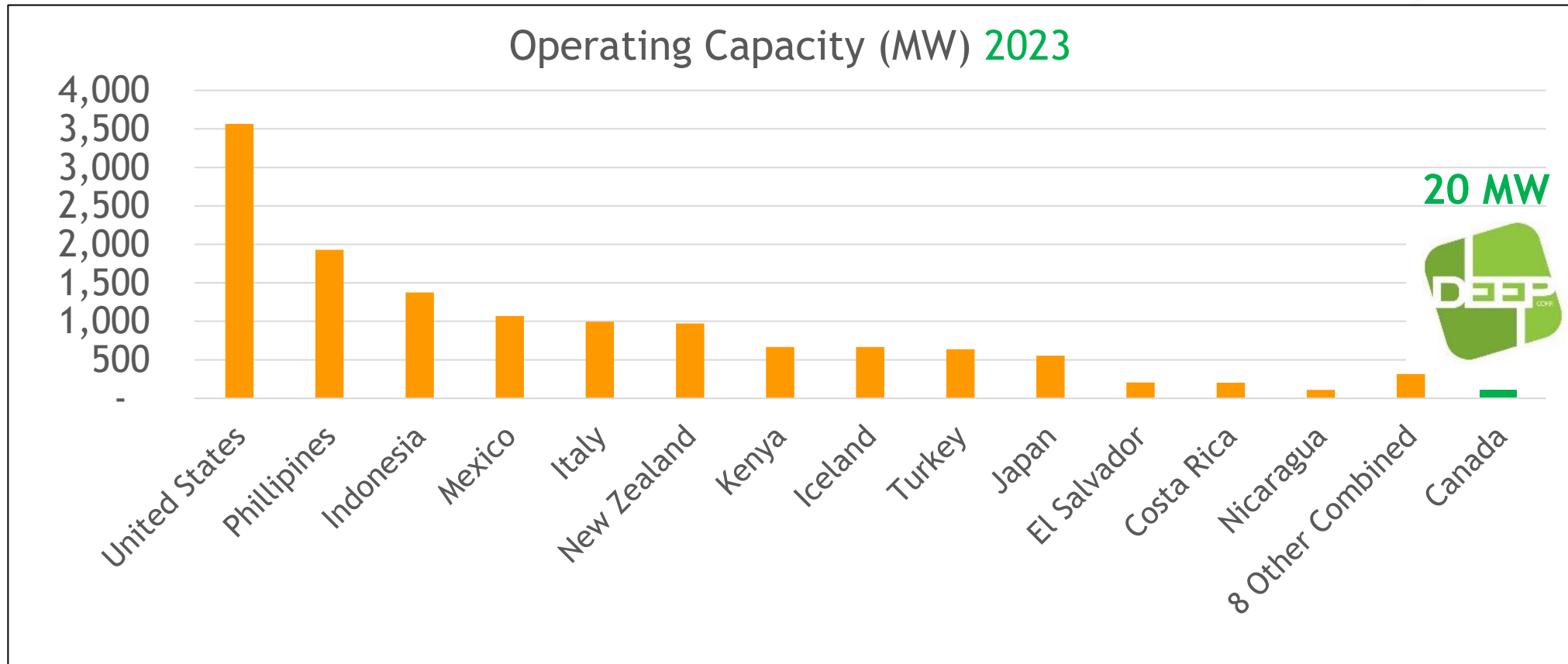
CANADA LAGS IN GEOTHERMAL - A SUCCESSFUL PROJECT WOULD OPEN THE DOOR TO A BRAND NEW CANADIAN CLEAN ENERGY INDUSTRY



Global geothermal capacity reaches 14,900 MW



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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**



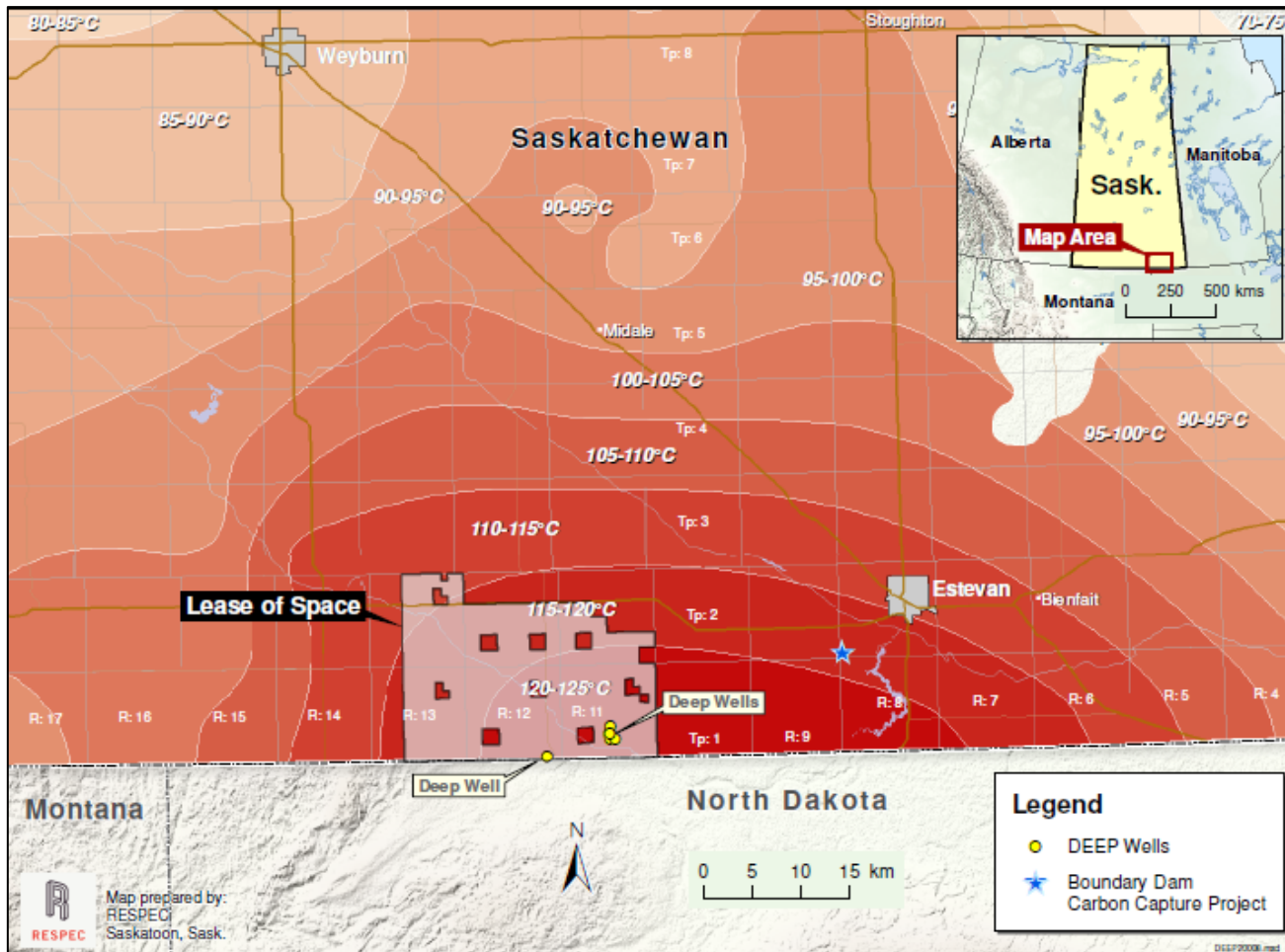
Iceland Strokkur geyser



DEEP's drilling location, south of Torquay, SK



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



- 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, 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

Canada



SUCCESSFUL FIRST EXPLORATION WELL – DECEMBER 2018



- 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**



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**

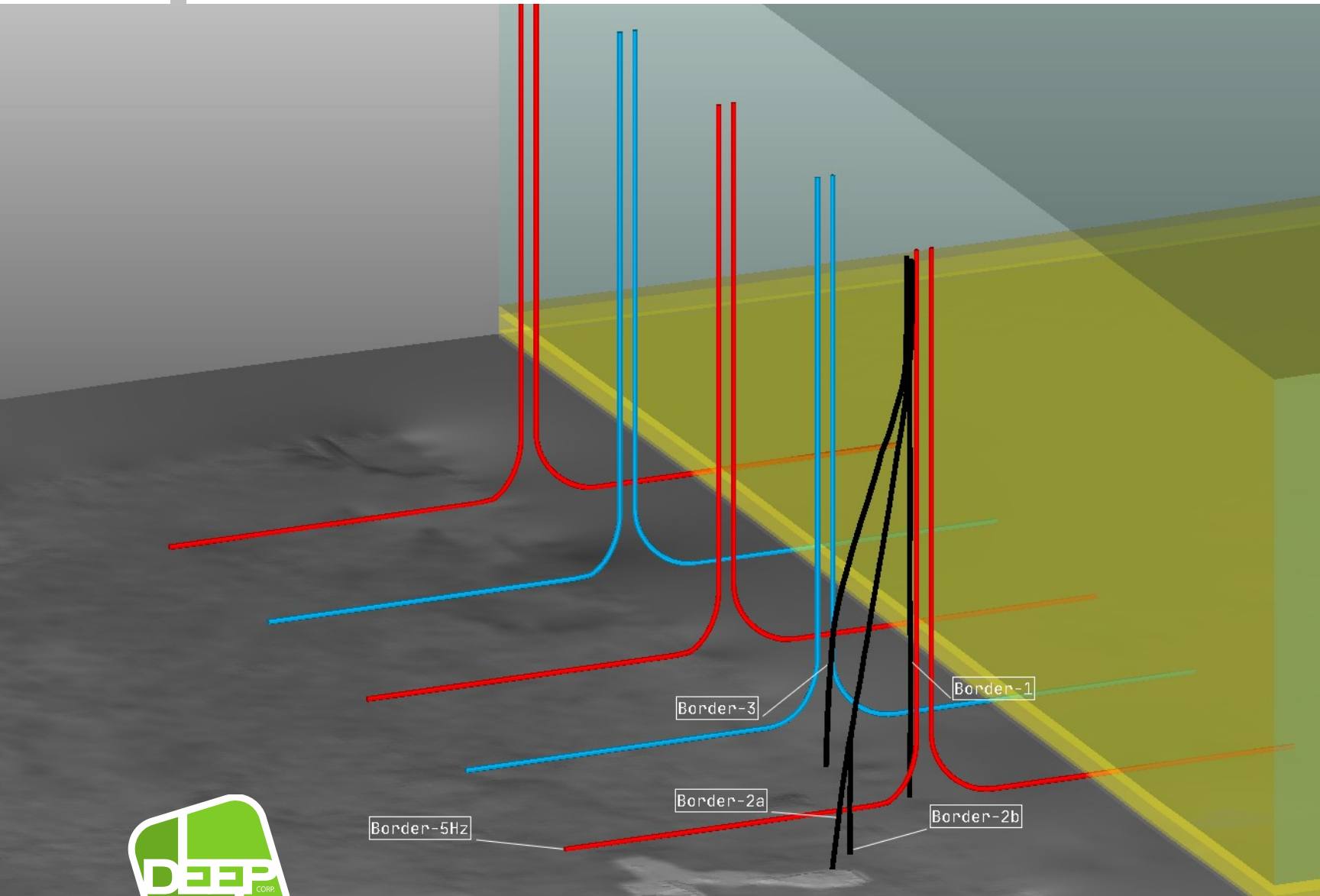


SASKATCHEWAN'S DEEPEST HORIZONTAL WELL – OCTOBER 2020

- The deepest horizontal well in Saskatchewan's history, allowing for the installation of a large volume submersible pump
- Hydraulically stimulated
- Producing out of this well and injecting 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**



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



SUCCESSFUL 54 DAY RESERVOIR PRODUCTION AND INJECTION TEST

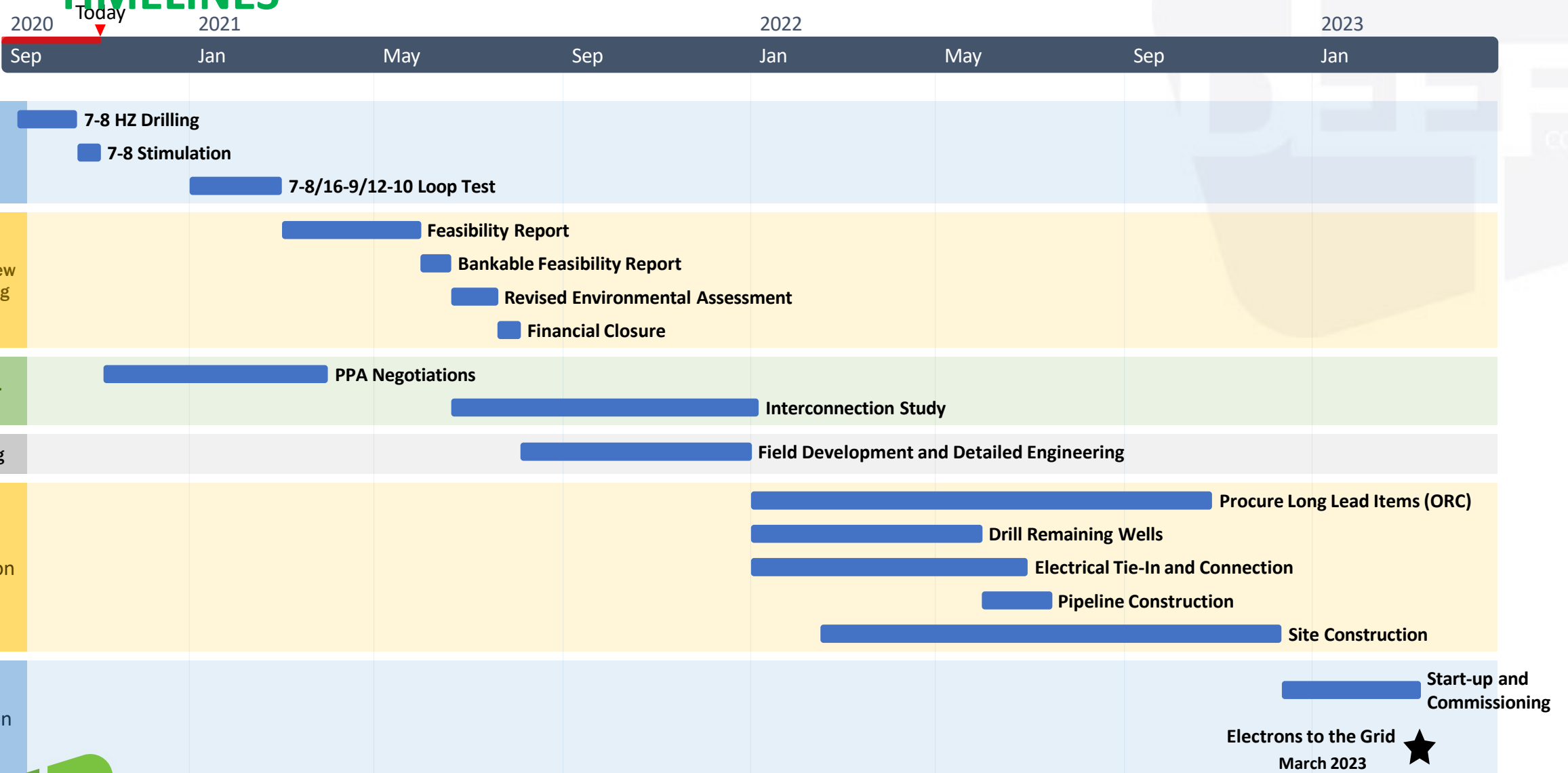
- Canada's first large volume production and injection geothermal field test
- This test was required to acquire the reservoir data needed to finalize the well design for Canada's first 20MW commercial geothermal power facility
- DEEP forecasts tangible capacity for significant scale up
- The test duration was 53 days and produced 89,112m³ brine from the Border-5HZ horizontal well (announced November 24, 2020), injecting into Border-1 and Border 3 vertical wells





COMPLETION OF FEASIBILITY ENGINEERING

TIMELINES





FUTURE

FUTURE BUILD-OUT IS SIGNIFICANT



- 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



Courtesy: ORMAT

CLEAN ENERGY TRANSITION



- This first 20 MW field would offset approximately **100,000 metric tonnes of CO₂/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



GEOHERMAL: 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**



CURRENT CAPITALIZATION

Project Financing to Date	\$	Participants
Equity investment	\$20M	Equity Investment
Grant Funding Cash Received to date	\$30M	NRCan, Innovation SK, SaskPower
Total	\$50M	

Current Capitalization	
Shares Issued:	46,477,889 common voting shares
Options:	3,250,000 options to purchase at \$0.50
Warrants:	17,762,700 Warrants to purchase at \$0.50
Fully Diluted:	67,490,589 common voting shares



EXCITING TIMES ADVANCING THIS WORLD CLASS PROJECT

