



GeoRePORT: Geothermal Resource Portfolio Optimization & Reporting Technique

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Clean Energy Solutions Center Webinar

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Temperature Grades

Sanyal Classification

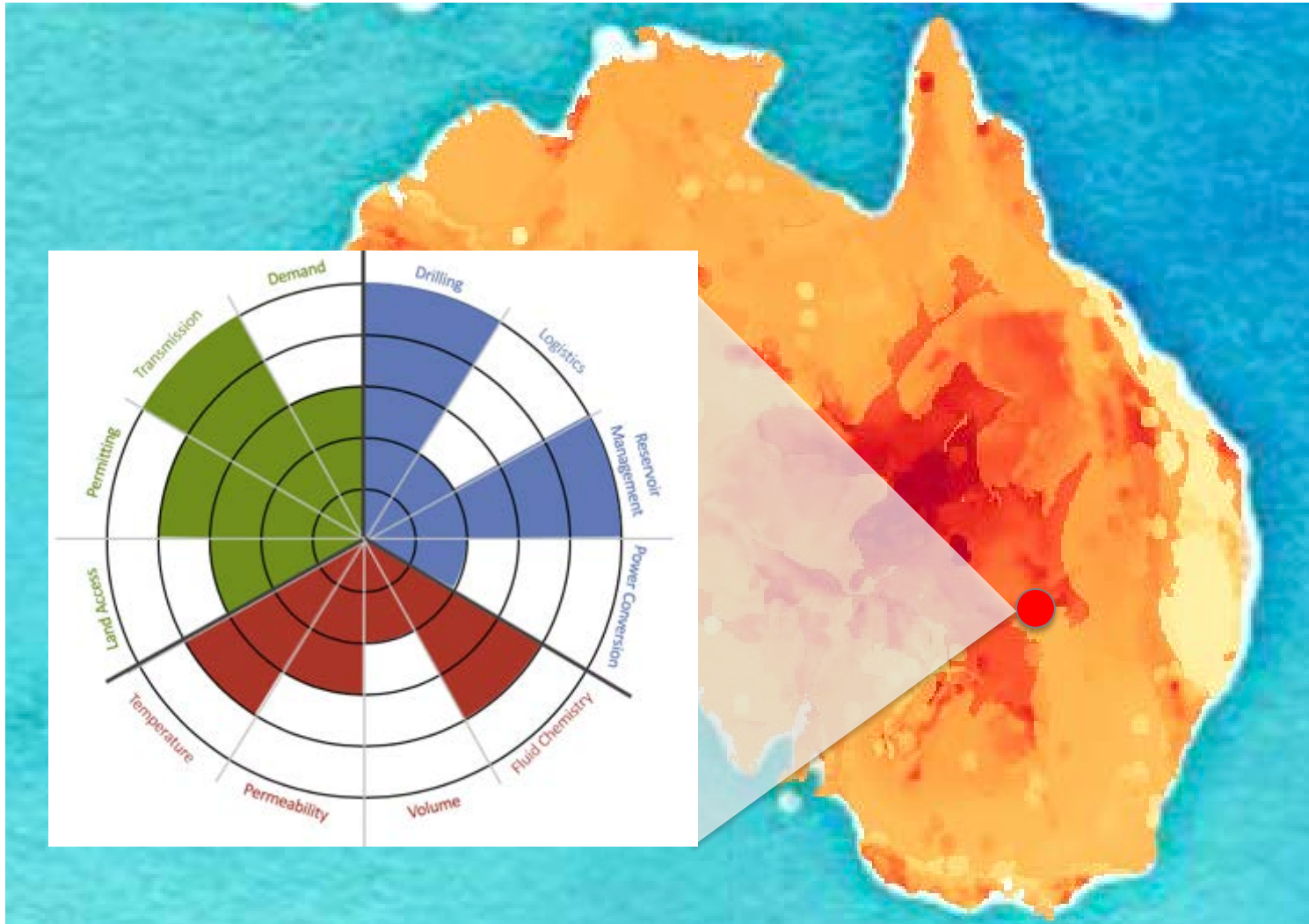
Class of Resource	Reservoir Temperature	Mobile Fluid Phase in Reservoir	Production Mechanism	Fluid State at Wellhead	Well productivity and Controlling Factors other than temperature	Applicable Power Conversion Technology	Unusual Development or Operational Problems
Extremely Low Temperature*	< 100°C	Liquid water	Artesian self-flowing wells; pumped wells	Liquid water	Well productivity dependent on reservoir flow capacity and static water level	Direct Use; Binary (in areas of very low air temperatures)*	
Very Low Temperature	100°C to 150°C	Liquid water	Pumped wells	Liquid water (for pumped wells); steam-water mixture (for self-flowing wells)	Typical well capacity 2 to 4 MWe; dependent on reservoir flow capacity and gas content in water; well productivity often limited by pump capacity	Binary	
Low Temperature	150°C to 190°C	Liquid water	Pumped wells; self-flowing wells (only at the higher-temperature end of the range)	Liquid water (for pumped wells); steam-water mixture (for self-flowing wells)	Typical well capacity 3 to 5 MWe; dependent on reservoir pressures, reservoir flow capacity and gas content in water; productivity of pumped wells typically limited by pump capacity and pump parasitic power need; productivity of self-flowing wells strongly dependent on reservoir flow capacity	Binary; Two-stage Flash; Hybrid	Calcite scaling in production wells and stibnite scaling in binary plant are occasional problems
Moderate Temperature	190° to 230°C	Liquid water	Self-flowing wells	Steam-water mixture (enthalpy equal to that of saturated liquid at reservoir temperature)	Well productivity highly variable (3 to 12 MWe); strongly dependent on reservoir flow capacity	Single-stage Flash; Two-stage Flash; Hybrid	Calcite scaling in production wells occasional problem; alumino-silicate scale in injection system a rare problem
High Temperature	230°C to 300°C	Liquid water; Liquid-dominated two-phase	Self-flowing wells	Steam-water mixture (enthalpy equal to or higher than that of saturated liquid at reservoir temperature); saturated steam	Well productivity highly variable (up to 25 MWe); dependent on reservoir flow capacity and steam saturation	Single-stage Flash; Hybrid	Silica scaling in injection system; occasionally corrosion; occasionally high NCG content

Partial screen capture from: http://en.openei.org/wiki/Sanyal_Temperature_Classification
 Subir K. Sanyal, 2005, Classification of Geothermal Systems: A Possible Scheme. In: Thirtieth Workshop on Geothermal Reservoir Engineering, 2005/02/02, Stanford, California, Stanford, California, Stanford University, p. SGP-TR-176

Temperature Contour Map

Australia - Opportunities for Enhanced Geothermal Systems (EGS)

predicted temperature of Australian Basement rocks at 1 km intervals between 3-10 km depth



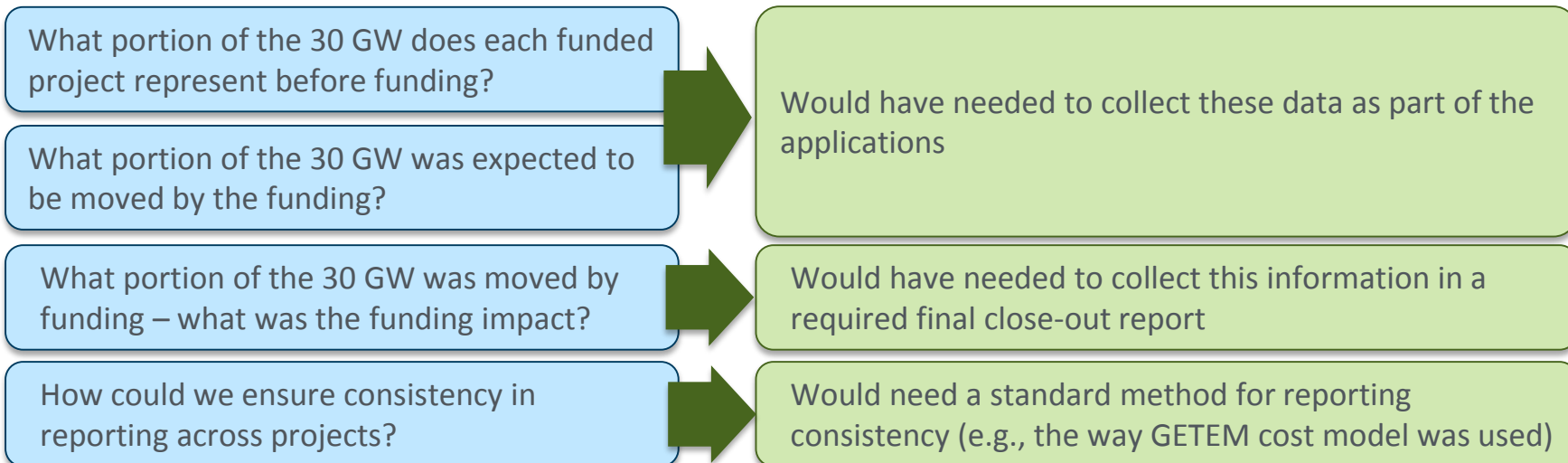
Source: IRENA Global Atlas

Challenge: How does GTO measure the impact of its funding?

Need for metrics for goal-setting and measuring impact

Example:

- When government funding became available in 2008, the U.S. National Geothermal Resource Assessment¹ had just been released—30 GW (mean) Undiscovered, 9 GW (mean) Identified
- One current program goal: “Accelerate development of 30 GWe of undiscovered hydrothermal resources” – but how is this measured?



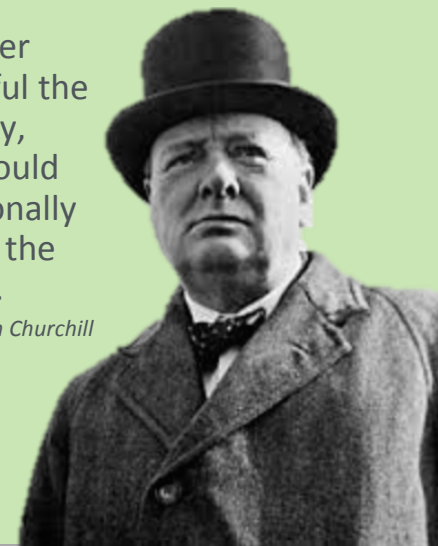
¹Williams, C.F., M.J. Reed, R.H. Mariner, J. DeAngelo, S.P. Galanis, Jr. (2008b). *Assessment of Moderate- and High-Temperature Geothermal Resources of the United States*, U.S. Geological Survey Fact Sheet 2008-3082, 4 p.

Additional Industry Challenges

- Apart from temperature and depth, how do we, as an industry, **grade** geothermal resources?
- What **data** are needed to measure baseline values and advancement?
- Which industry **barrier**, if overcome, has the potential to have the **largest impact** on geothermal deployment?
- How do you **set goals** to be impactful, and what is the potential impact realized by overcoming the prescribed program goals?
- How do we **communicate** these **goals, impacts, and advancements** to non-technical audiences (e.g., Congress, policymakers, the public)?

However beautiful the strategy, you should occasionally look at the results.

-Winston Churchill






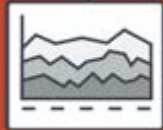

Why GeoRePORT?

A Barrier to Development

Experts in their fields produce large amounts of complex data.



Scientist

environmentally sensitive areas
topography **lithologic cores** *wellbore control* *transmission*
flow tests  *policies* *wildfire hazard* 
depth *calcite* *temperature* *cold water breakthrough*
tribal resources *land ownership* **degree of isolation**
state lease queue *geothermometry*  **FMI logs**
non-condensable gas content *titration* *fluid inclusions* 
permeability  *pH analysis* *water for cooling* *active seismic reflection*
regulation *drilling experience* *bottom hole diameter* *site road access*
conductivity *conceptual model* **gravity survey**
field mapping



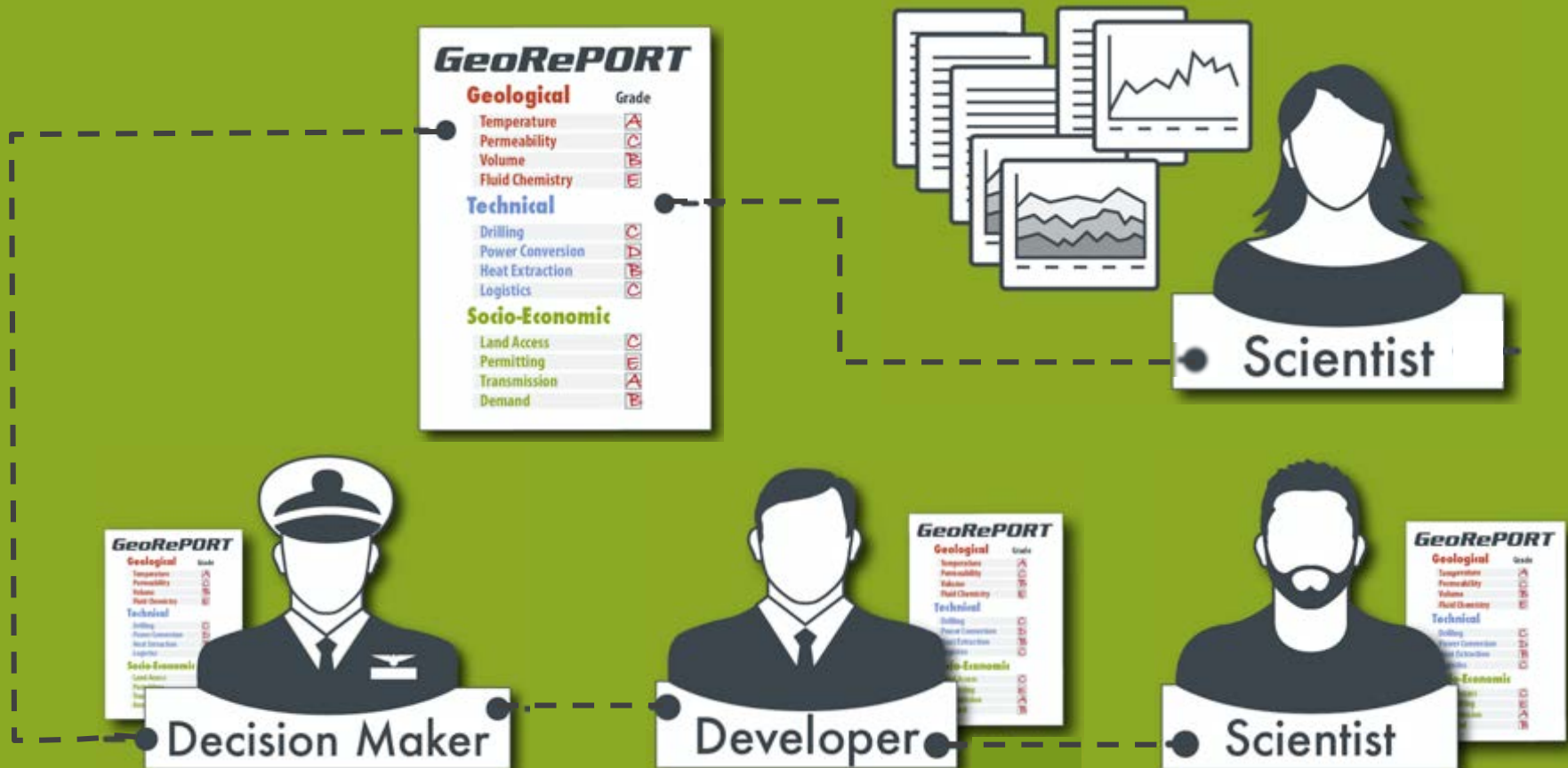
Decision Maker

Volumes of scientific data can be incomprehensible and overwhelming for decision makers

Why GeoRePORT?

The Solution

Data is translated by experts to a common language, which both experts and non-experts can use to communicate effectively.

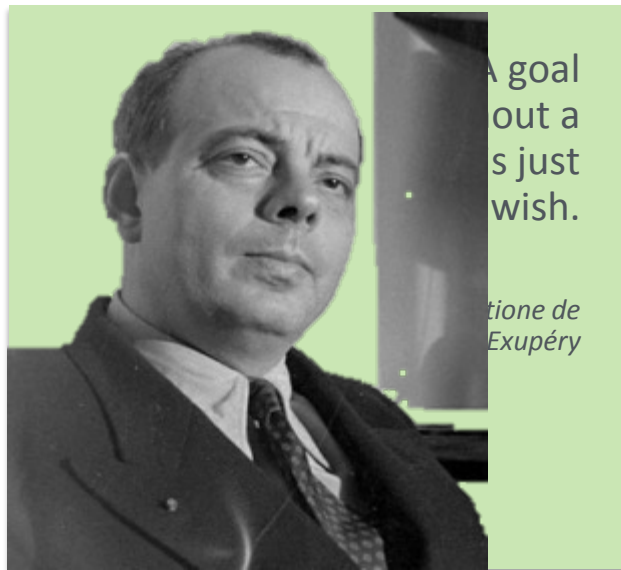


Purpose of Research

Objective

The goals of this project were to:

- Develop a clear, objective, comprehensive, understandable methodology for reporting geothermal resource grade and project progress.
- Provide examples for using the methodology for goal setting, measuring baselines, and reporting the impact of funded projects.



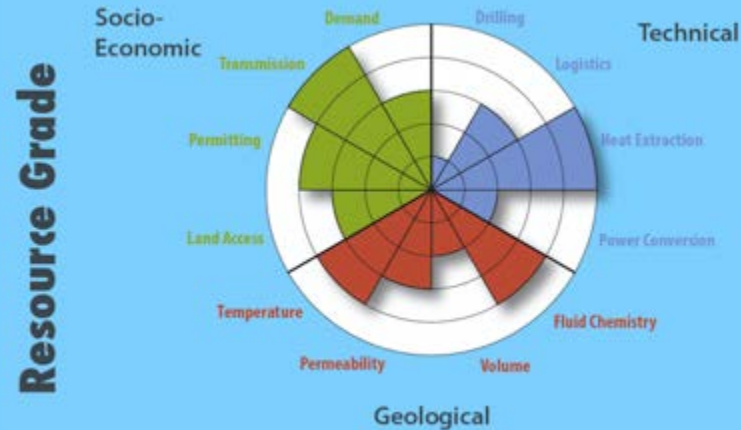
This methodology will help to:

- Quantitatively **identify** the greatest barriers to geothermal development
- **Develop** measureable program goals that will have the greatest impact to geothermal deployment
- Objectively **evaluate** proposals based (in part) on a project's ability to contribute to program goals
- **Monitor** project progress
- **Report** on portfolio performance.

How it Works

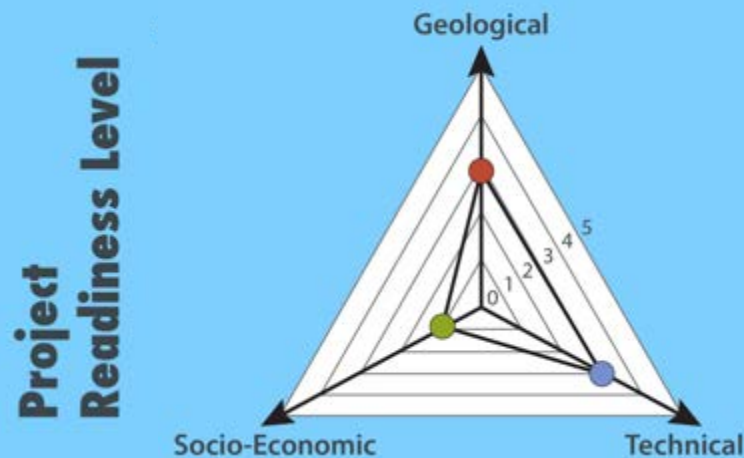
How it Works

Two parts to the GeoRePORT System: Resource Grade and Project Readiness Level



How good is our resource?

The resource grade is an assessment of resource quality which allows for an apples-to-apples comparison.



How far along is our project?

The project readiness level is an assessment of the progress of the major components of a project.

OVERVIEW OF METHODOLOGY

Resource Grade

- To evaluate each attribute (e.g., temperature, volume) systematically, we developed three indices—*character*, *activity*, and *execution*
- Indices are independently evaluated for each attribute using qualitative grades of A-E (A being the “best”).

Character Grade

- Used to describe the attribute itself
- Should not change throughout the project (unless originally incorrectly assigned)

Activity Index

- Qualitative ranking of activities used to assign the character index; appropriate for each attribute
- Progressive throughout the project as additional activities are conducted

Execution Index

- Compares the diligence with which the technique was executed for the activity
- May progress, if activities are repeated.

Indicates
grade

Indicate
certainty

Example: **Geological**

Four attributes: **Temperature**
Volume
Permeability
Fluid Chemistry

Technical

Power Conversion
Reservoir Management
Drilling
Logistics

Socio-economic

Land Access
Permitting
Transmission
Market

How it Works

Resource Grade: Example Attribute Indices - **Temperature**

(a)

Character Index

A	>300°C	High-temperature two-phase liquid-dominated OR high enthalpy vapor-dominated
B	230 - <300°C-	Two-phase liquid-dominated systems: - high T, high enthalpy - moderate T, moderate enthalpy
C	150- <230°C	Moderate to low temperature, moderate to low enthalpy liquid-only systems
D	90-<150°C	Low temperature systems
E	<90°C	Very low temperature systems

(b)

Activity Index

A	Measured temperatures: Downhole temperature probe readings (well(s) drilled into reservoir)
B	Extrapolated temperatures: (TGH/well(s) not drilled into reservoir)
C	Geothermometry (reservoir brines or gases)
D	Geothermometry (immature or mixed fluids, inconsistent results between geothermometers)
E	Regional heat flow data

(c)

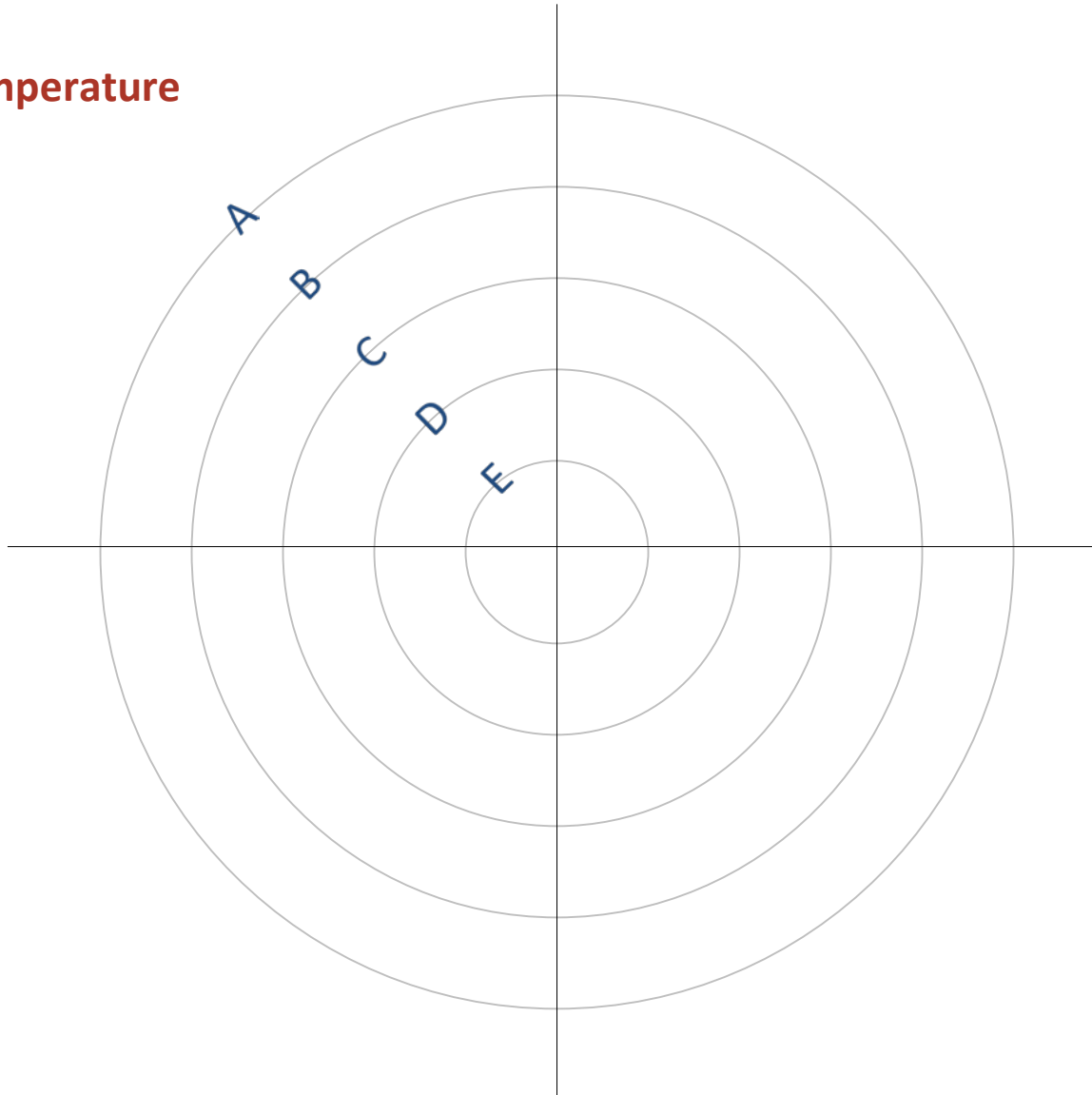
Execution Index

(Ex: Subsurface Temperature Probe Readings)

A	<ul style="list-style-type: none"> Probe allowed to equilibrate Cuttings and/or geophysics confirms measurement within the reservoir (i.e. downhole alteration mineralogy consistent with reading)
B	<ul style="list-style-type: none"> Probe allowed to equilibrate Cuttings and/or geophysics have <i>not</i> confirmed measurement within the reservoir (i.e. downhole alteration mineralogy not consistent with readings)
C	<ul style="list-style-type: none"> Probe <i>not</i> allowed to equilibrate Cuttings and/or geophysics have <i>not</i> confirmed measurement within the reservoir
D	<ul style="list-style-type: none"> Results taken from previous third-party studies of the area (either literature or contractors) with little or limited information on survey methods, replication, or error.
E	<ul style="list-style-type: none"> Assumed from studies of analogous geothermal settings, or extrapolated from studies of nearby areas.

How it Works

Temperature



Resource Grade
Polar Area Chart

The bigger the pie piece, the better the attribute grade

How it Works

Temperature

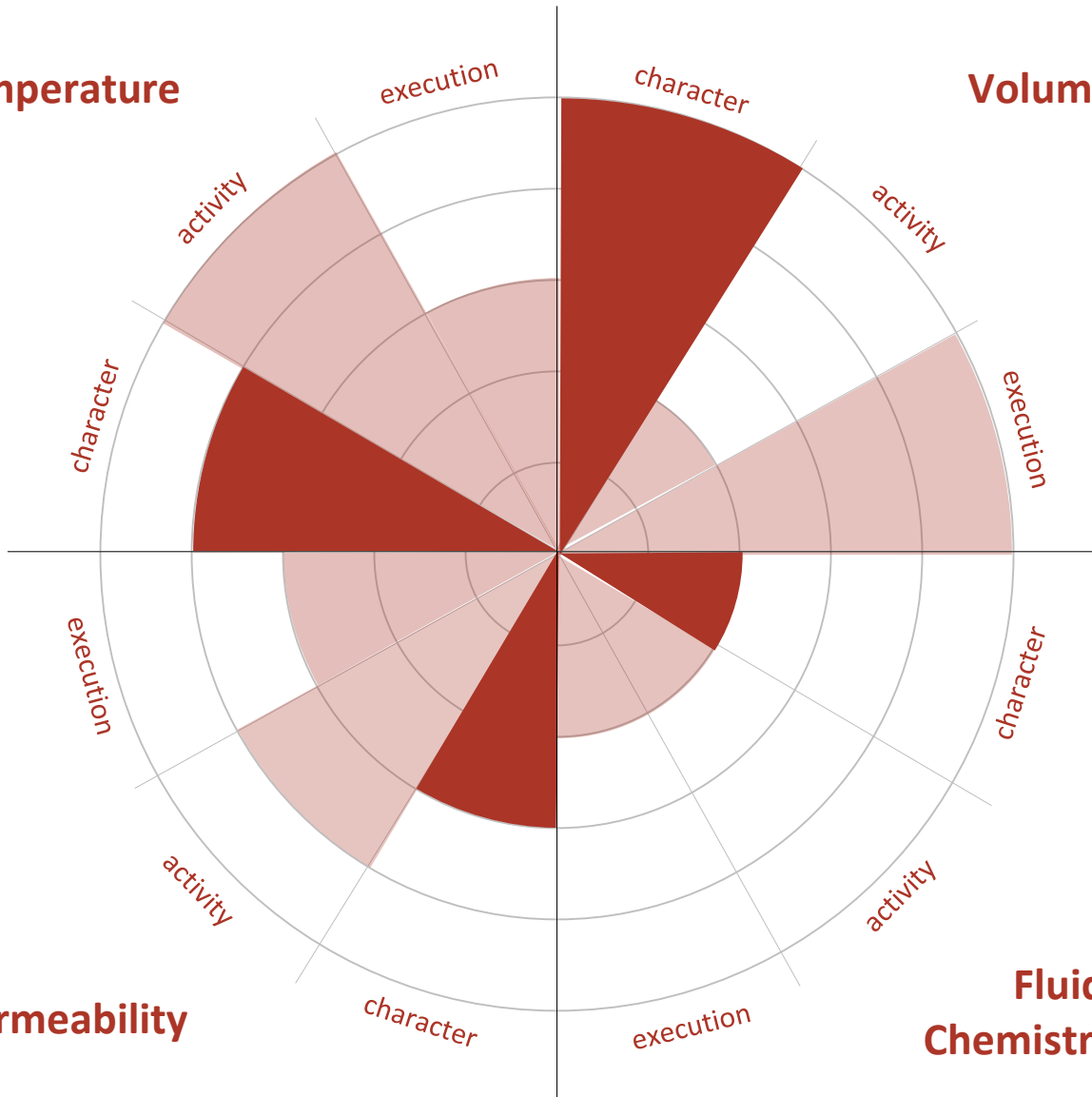
Volume

**Resource Grade
Polar Area Chart**

The bigger the pie piece, the better the attribute grade

Dark Wedges
indicate grade

Light Wedges
indicate certainty

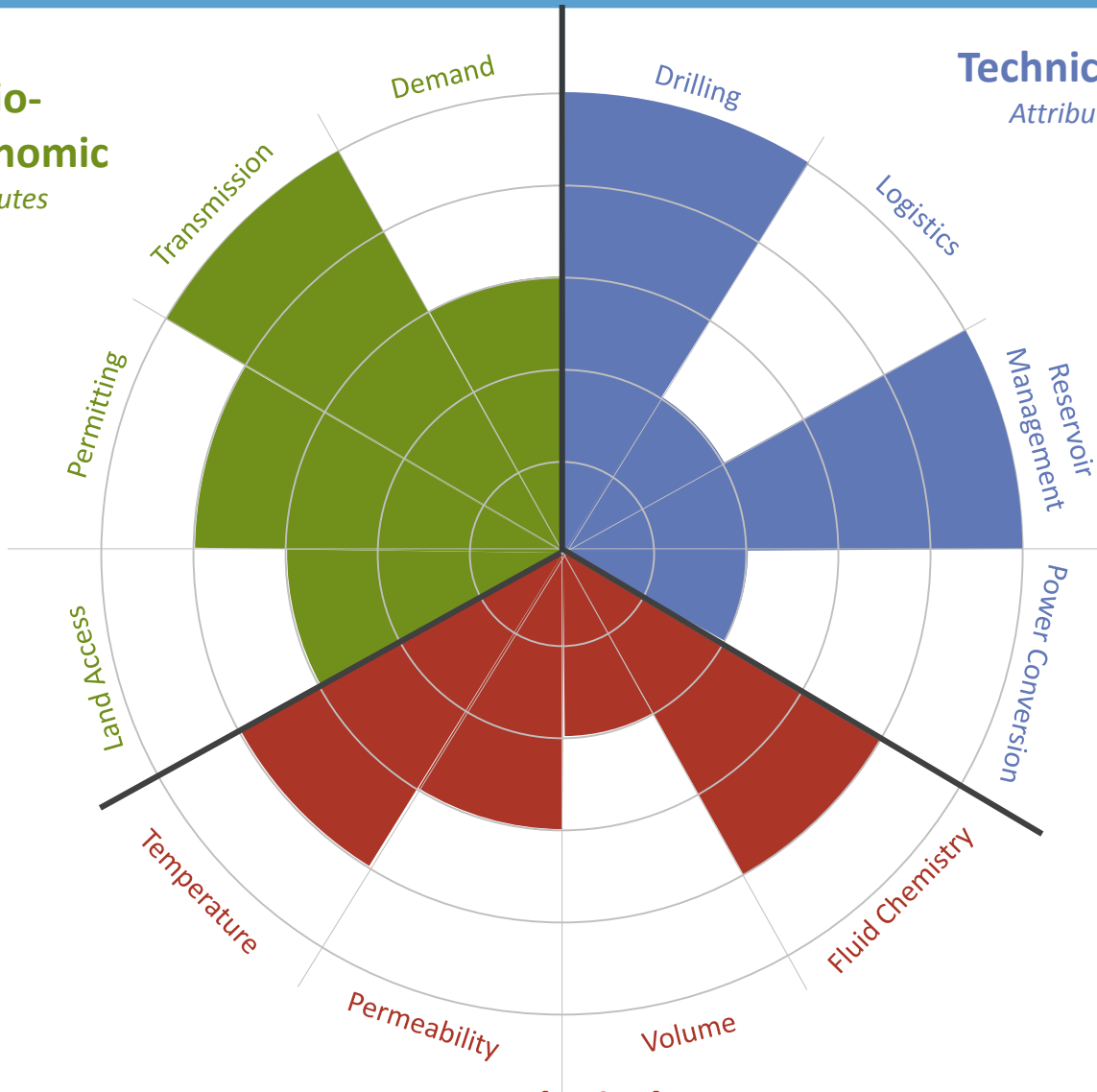


How it Works

Socio-Economic
Attributes

Technical
Attributes

Geological
Attributes



Resource Grade Summary Chart

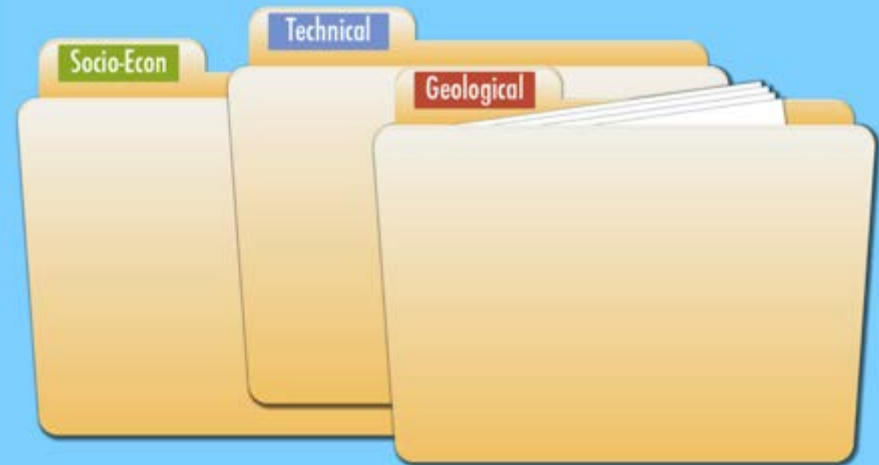
Displaying all 12 Character Grades in one graphic

How it Works

How it Works

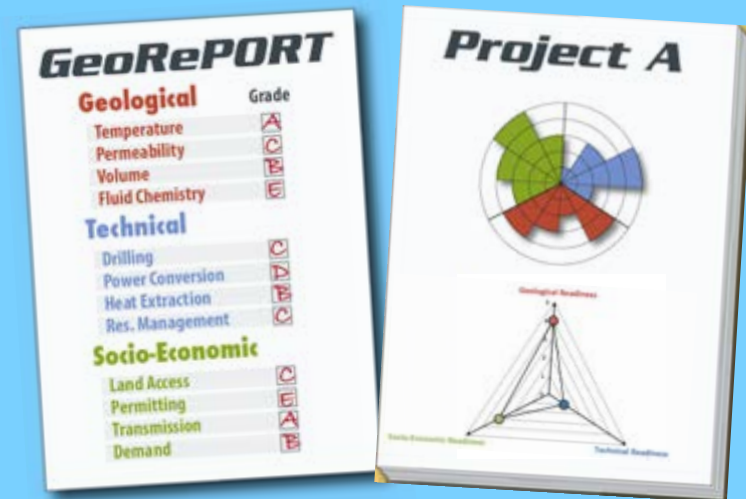
2 Grades from many experts are assembled

Grading from many different experts on a huge variety of data can be collected and assembled, and individual reports can be added, removed or updated as needed.



3 GeoRePORT is compiled

Collected reports can be combined into a complete GeoRePORT, which helps everyone to speak the same language and allows non-experts to understand the suitability of the data.



Using GeoRePORT

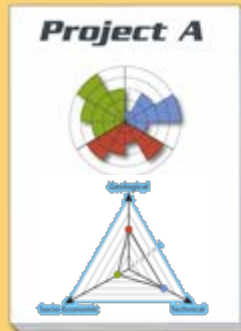
Ways to Use It

II. The Project Level



At the project level, GeoRePORT allows for different projects to be directly compared in terms of resource quality and project readiness. It can also be used to monitor project progress.

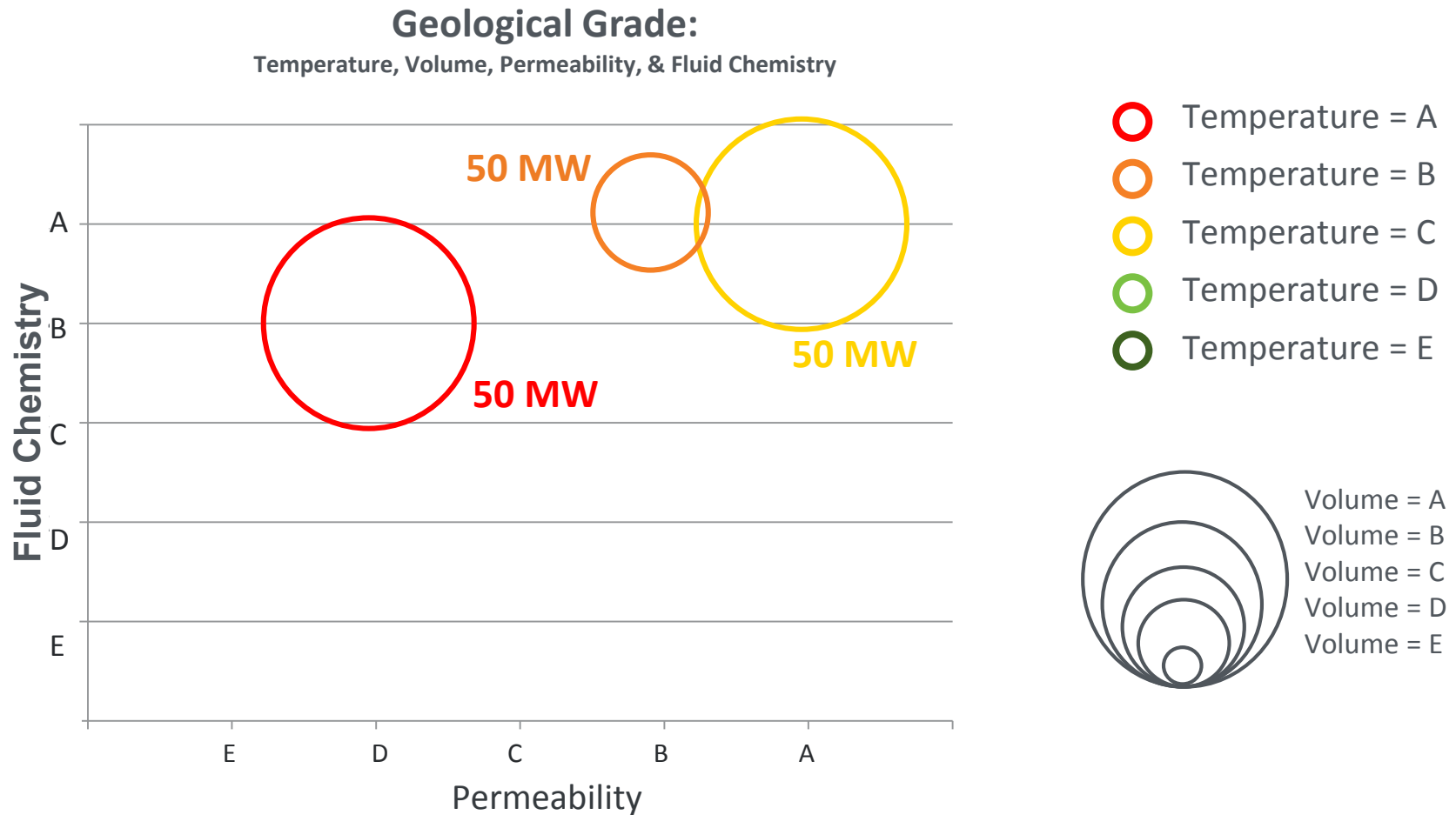
Private Industry Data



- Location Specific
- Highly Detailed
- Track Progress
- Compare Projects

Using GeoRePORT

EXAMPLE: Visualizing Grade for Multiple Geothermal Areas



Ways to Use It

Publicly Available Data

I. The National Level

Activity Level

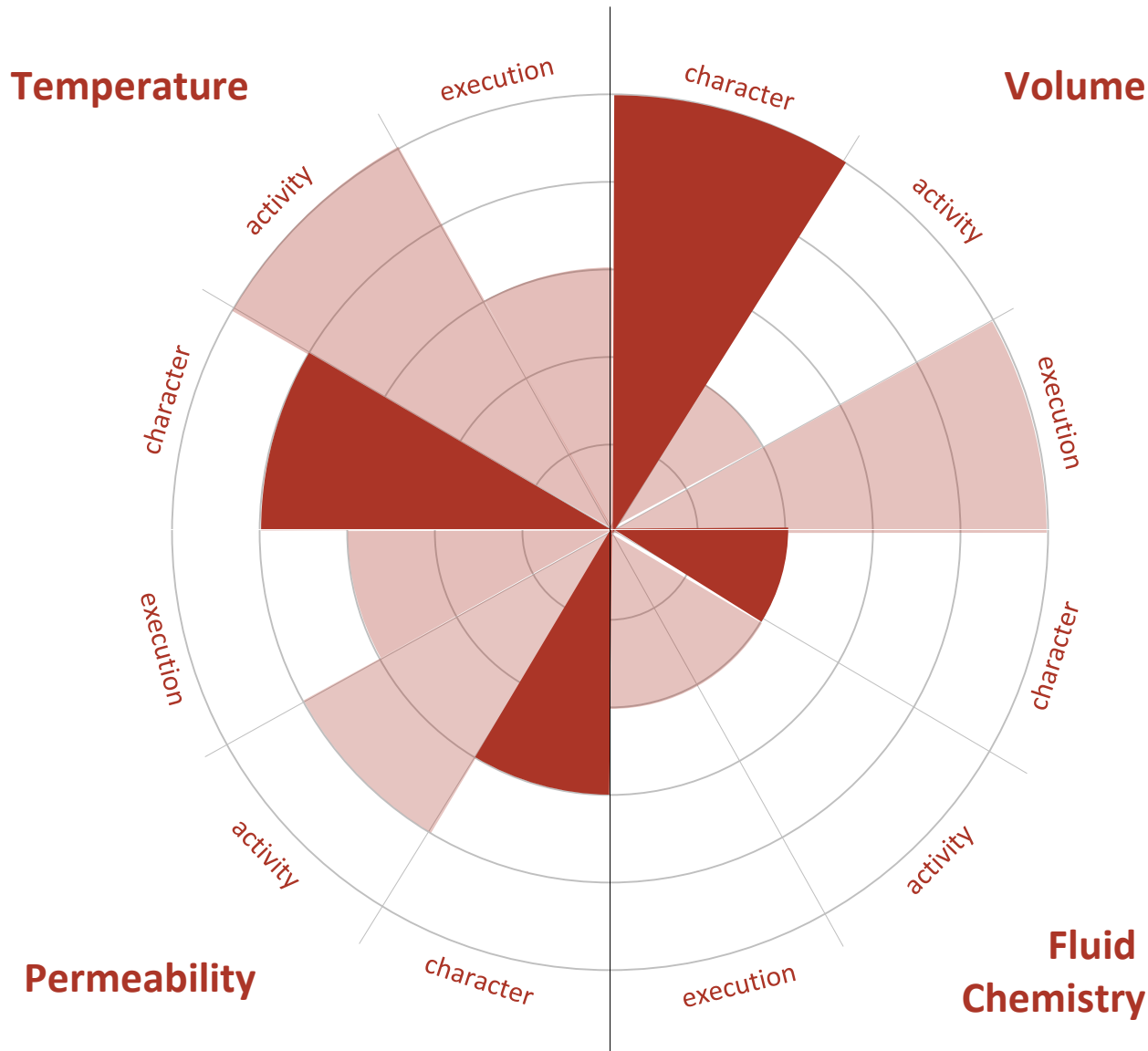
A B C D **E**

At the national level, GeoRePORT allows for the creation of baseline maps using publicly available data which can be used by DOE to identify the greatest barriers to geothermal development and to aid in setting quantifiable, measurable program goals.



- Identify Major Barriers
- Identify Resource Availability
- Set Baseline Goals
- Measure Impacts

Using GeoRePORT



Resource Grade Polar Area Chart

The bigger the pie piece, the better the attribute grade

Dark Wedges
indicate grade

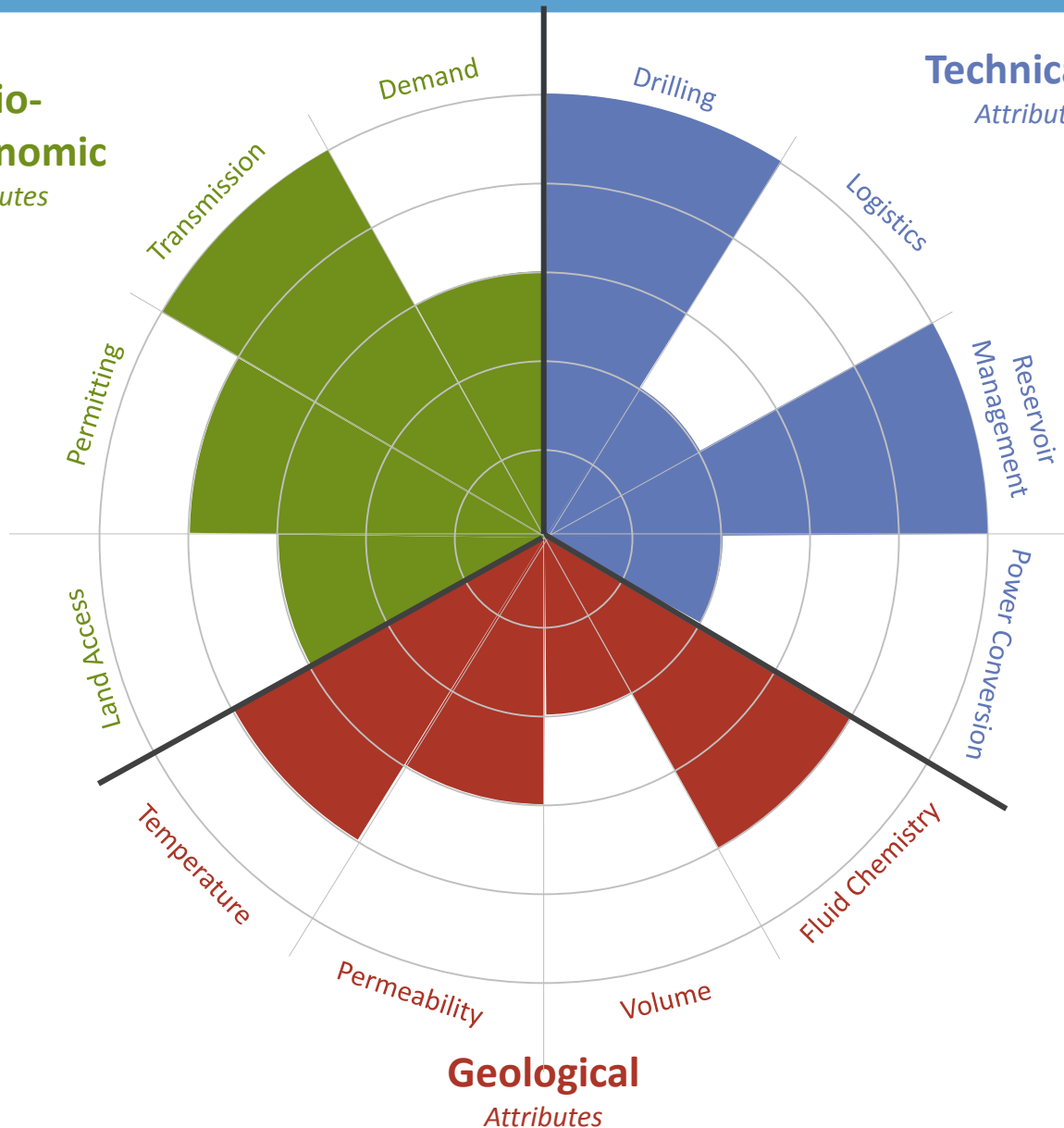
Light Wedges
indicate certainty

Using GeoRePORT

Socio-Economic Attributes

Technical Attributes

Geological Attributes



Resource Grade Summary Chart

Displaying all 12 Character Grades in one graphic

Using GeoRePORT

Sub-attribute	Weight
Cultural and Tribal Resources	3
Environmentally Sensitive Areas	3
Biological Resources	3
Land Ownership	2
Federal and State Lease Queue	1
Military Installation	1

Land Access

Market

Permitting

Transmission



Sub-attribute	Weight
Policies	2
Incentives	2
Market Demand	1
Wholesale Price of Electricity	1

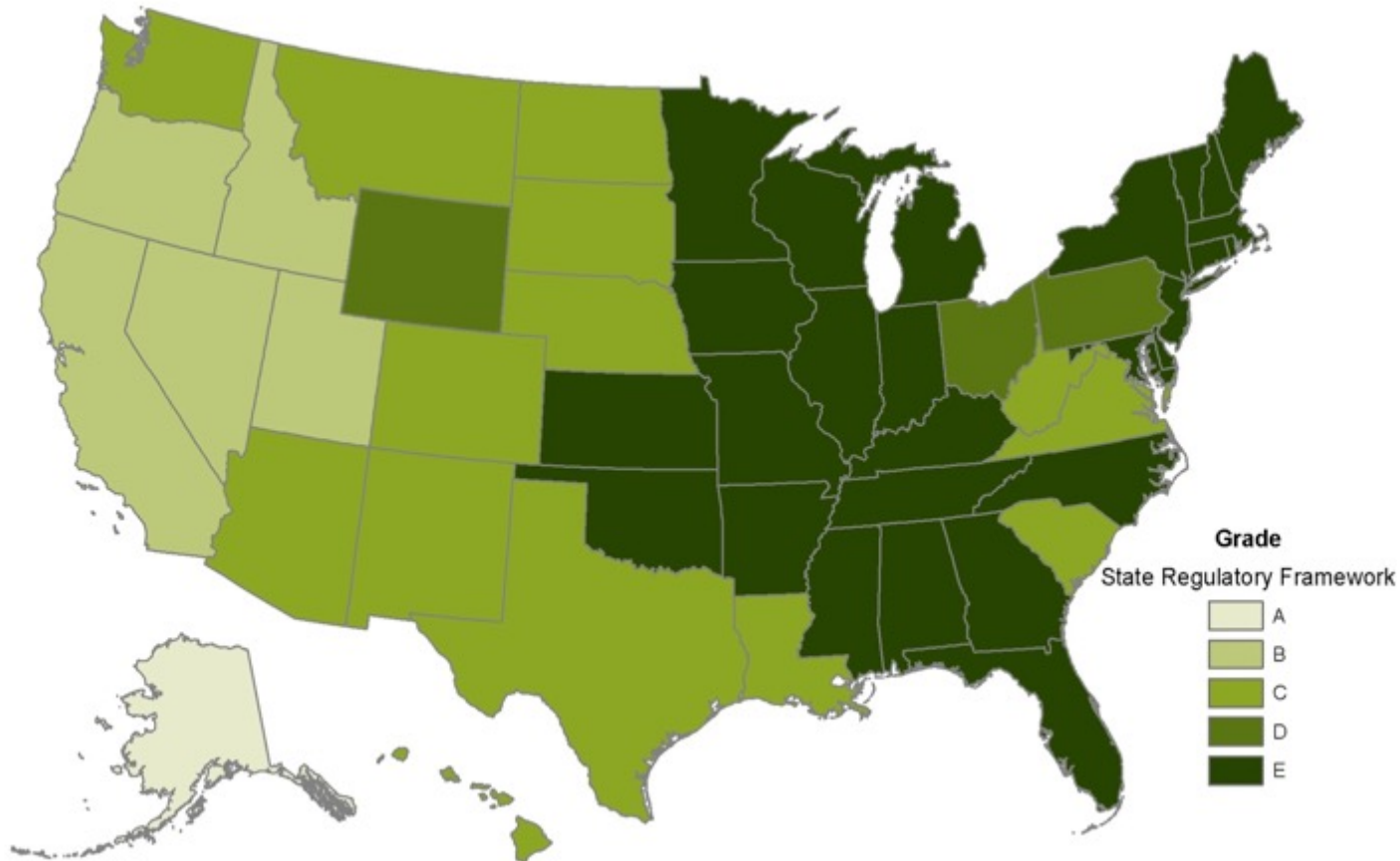
Sub-attribute	Weight
Environmental Review Process	3
Regulatory Framework	2
State Regulatory Framework	2
Federal Regulatory Framework	2
Ancillary Permits	1

Sub-attribute	Weight
Distance to the nearest transmission line	1
Interconnection costs	1
Transmission (wheeling) costs	1

Example Sub-Attribute Map

Attribute: Permitting

Sub-Attribute: State Regulatory Framework



A State/County has a permit coordinating office, geothermal regulations and experience successfully permitting projects

B State/County has geothermal regulations and experience successfully permitting projects

C State/County has geothermal regulations, but has not successfully permitted a project or is in the process of changing the regulations

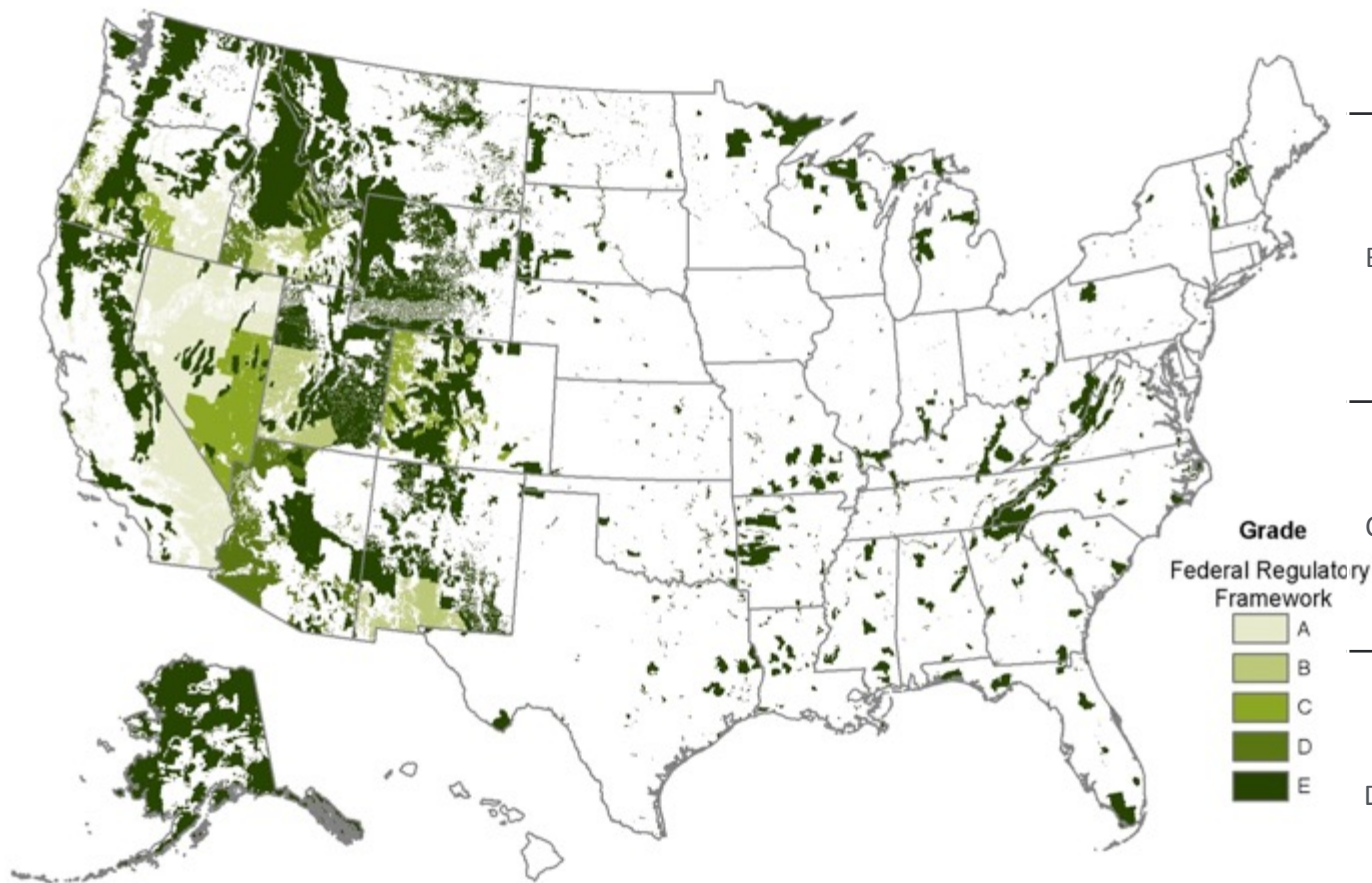
D State/County has a definition of geothermal resources, but does not have permitting regulations

E State/County does not have any geothermal power regulations

Example Sub-Attribute Map

Attribute: Permitting

Sub-Attribute: Federal Regulatory Framework

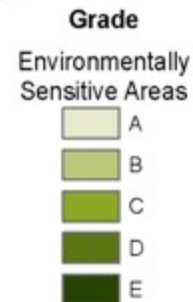
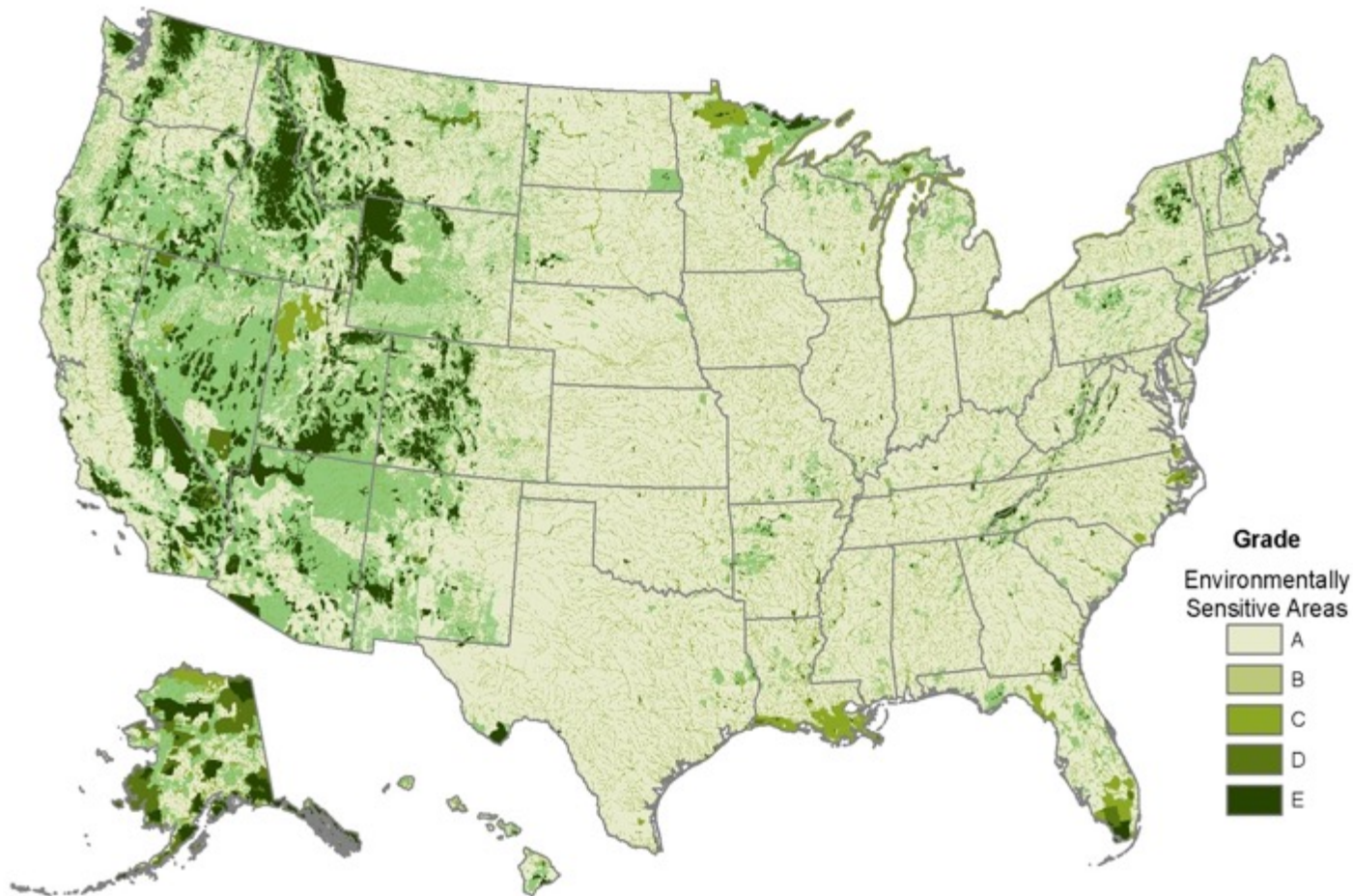


- A BLM-administered mineral estate in an area with experience permitting geothermal exploration and development projects and BLM has an MOU with the state.
- B BLM-administered mineral estate in an area with experience permitting geothermal exploration and development projects and BLM does not have an MOU with the state.
- C BLM-administered mineral estate in an area without experience permitting geothermal exploration and development projects and BLM has an MOU with the state.
- D BLM-administered mineral estate in an area without experience permitting geothermal exploration and development projects and BLM does not have an MOU with the state.
- E No geothermal staff or funding

Example Sub-Attribute Map

Attribute: Land Access

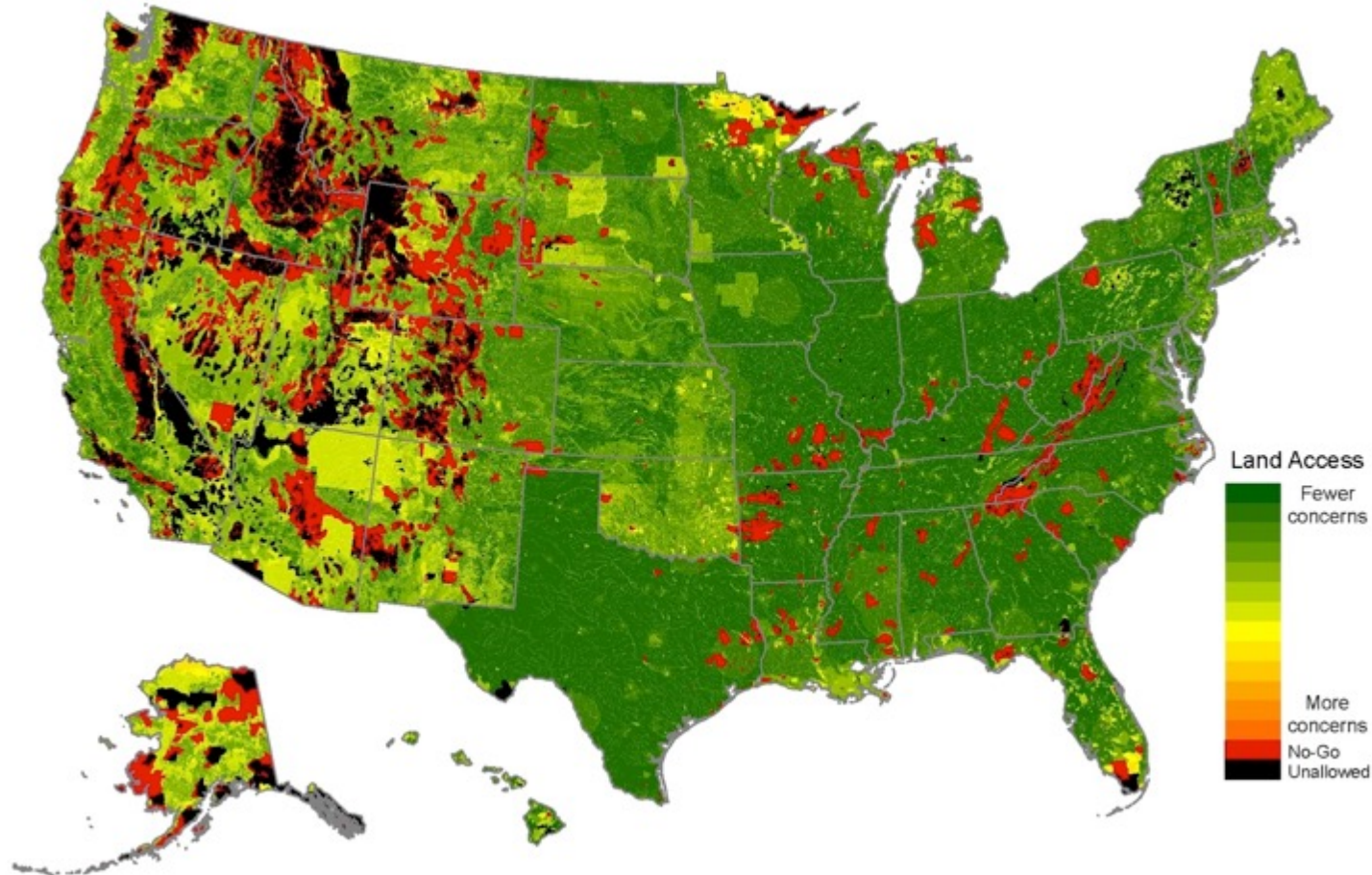
Sub-attribute: Environmentally Sensitive Areas



- | | |
|---|--|
| A | Not located in an environmentally sensitive area. 2-3 month staff review. |
| B | Manageable environmental sensitivities (recreational, geologic, wildlife or scenic value) 3-6 month staff review |
| C | Environmentally sensitive area complications (Waters of the United States) 6 - 12 month staff resolution. |
| D | Difficult environmentally sensitive area complications (Wild and Scenic Rivers, National Wildlife Refuge, National Preserves) Not likely to resolve, 1-2 years or longer if resolution possible. |
| E | Extreme environmentally sensitive area complications (National Park, National Monument, wilderness areas or wilderness study areas, U.S. Forest Service (USFS) inventoried roadless areas*, state and private conservation land) Not likely to be resolved, 2+ years |

Example Sub-Attribute Map

Attribute: Land Access



This map represents the summary of all of the Land Access sub-attributes. The colors in the summary map reflect a range of scores from 12 (all six sub-attributes graded as A) to 60 (all six sub-attributes graded as E). *Unallowed* areas (grade E) are shown in black; *significant-barriers* areas (grade D) are shown in red.

Example Program Planning

USGS Identified Potential	9,197	100%
Sites <=150°C	1,634	18%
Developed (as of 2010)	2,612	28%
Unallowed	129	1%
Developer-Identified "Significant Barriers"	796	9%
Remaining Clear MW	4,027	44%

Unallowed areas were due to biological or environmentally sensitive areas

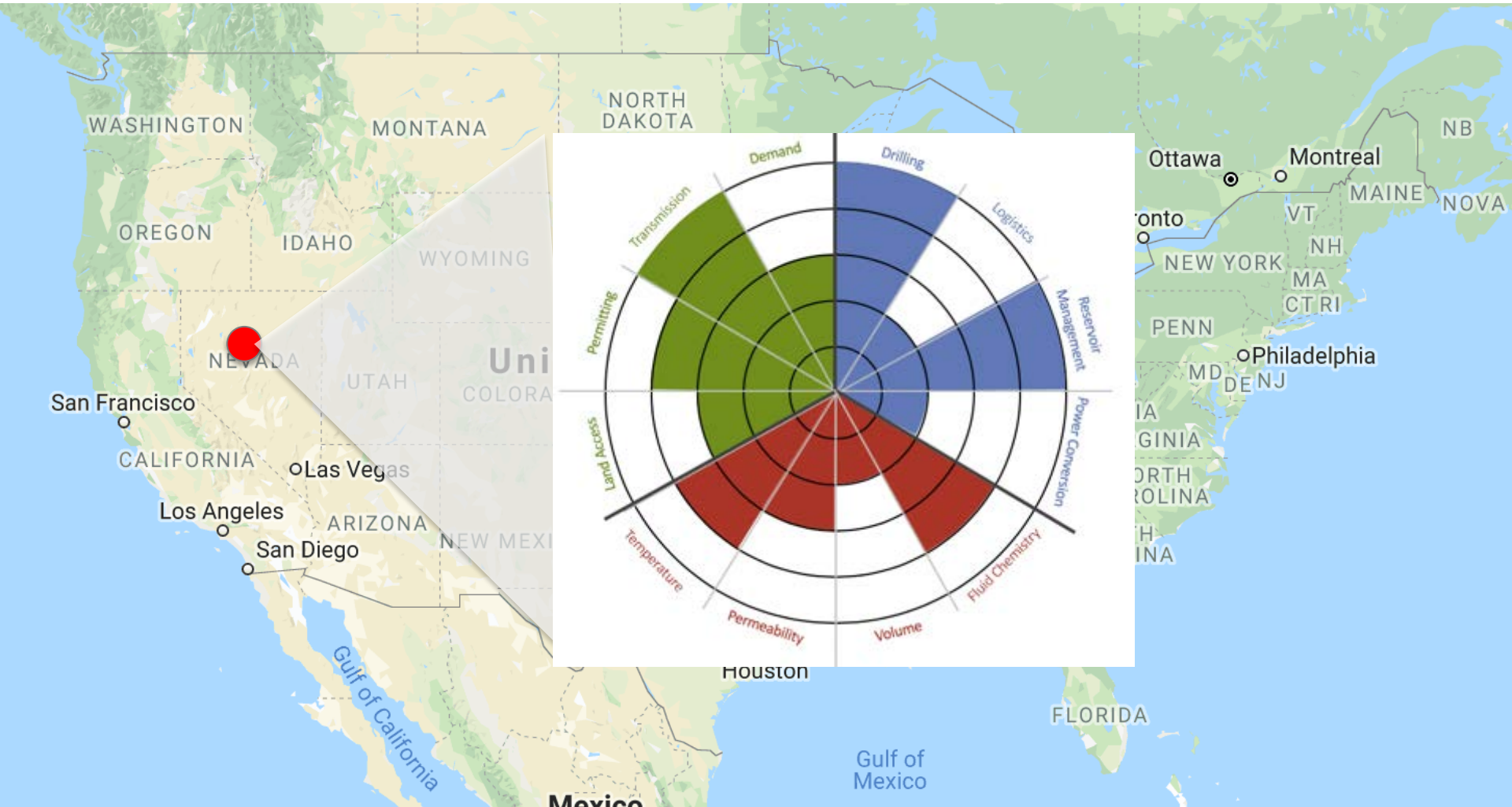
USGS Undiscovered Potential	30,033	100%
Unknown MW (AK, HI)	4,223	14%
Developed (as of 2010)	0	0%
Unallowed MW	5,350	18%
Developer-Identified "Significant Barriers"	7,387	25%
Remaining Clear MW	13,073	44%

USGS map doesn't cover Alaska or Hawaii, so we couldn't overlay barriers maps – remaining 4.2 GW were not analyzed for impact of barriers.

Developer-Defined Significant Barrier(s)	Identified MW Affected
Environmentally Sensitive Area (ESA)	401
Lease, Cultural	266
Transmission, ESA	62
Lease	50
Biological	18
TOTAL	796

Developer-Defined Significant Barrier(s)	Undiscovered MW Affected
Lease	2,668
Transmission	2,629
Biological	790
Lease, Transmission	606
Biological, Transmission	381
Environmentally Sensitive Areas (ESA)	168
Other Combinations	145
Total	7,387

GeoRePORT Tools: GeoProspector



[Geothermal Prospector](#) (Globally [RE Explorer](#))

GeoRePORT Tools: GeoProspector

Geothermal Resource Reporting

Reset

Description

The GeoRePORT System was developed out of a need by the GTO to track and measure the impact of research, development, and deployment funding for GTO funded geothermal projects (Young et al., 2015). While other geothermal reporting systems exist, such as the Australian and Canadian Geothermal Reporting Codes (AGEA and AGEG 2010, CanGEA 2010) and the United Nations Framework Classification (UNFC) System (UNECE, 2013), the GeoRePORT System is unique in providing a detailed system for reporting both the resource grade and the project readiness level, and is particularly useful for describing early-stage exploration projects.

Character Grade Summary

Socio-economic Attribute Grades

Land Access Attribute Grades

▼ Cultural/Tribal Resources

Character: B
Activity: E
Execution: None

Grade	Description
A	No known cultural or tribal resources present. No SHPO concurrence required, 60-90 day review.
B	Manageable cultural/tribal resources. State recognized jurisdictional tribal boundaries & 50 mile buffer for federally recognized jurisdictional tribal boundaries. - 4 months for BLM and SHPO concurrence.
C	Cultural/tribal resource complications or federally recognized jurisdictional tribal boundaries. 6-9 months for BLM and SHPO concurrence.
D	Difficult cultural/tribal resource complications. +3- 1

Land Access Character Grades

Sub-Attribute Summary

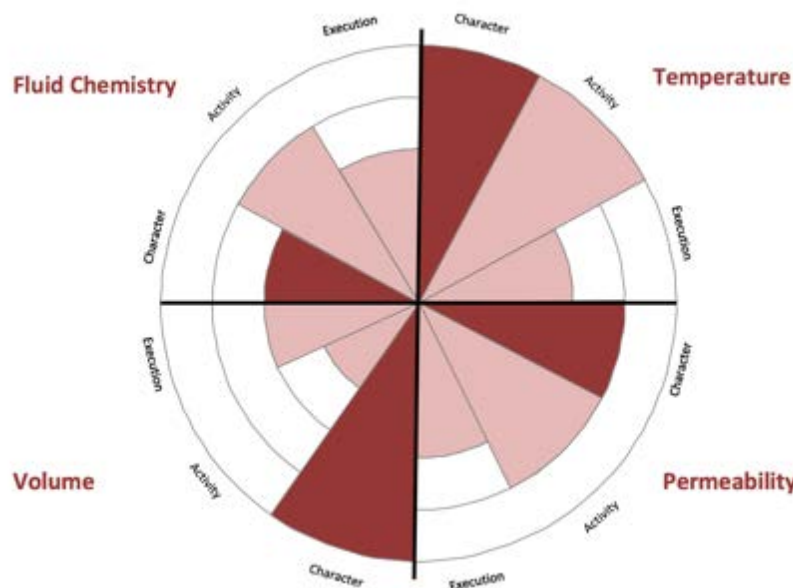
Land Access	Character Grade	Activity Index	Execution Index
Cultural/Tribal Resources	B	E	None
Environmentally Sensitive Areas	B	E	None
Biological Resources	no-go	E	None
Land Ownership	C	E	None
Federal Lease Queue	A	E	None
State Lease Queue	B	E	None
Proximity to Military Base	A	E	None

Screen capture from the GeoRePORT web tool on GeoProspector (<https://maps.nrel.gov/geothermal-prospector>) that provides a detailed look at the grades reported for a selected point location, based on country SEAT maps developed for the United States. (Text on actual web page continues beyond what can be shown in this screen capture.)

GeoRePORT Tools: Input Spreadsheet

ATTRIBUTE: Fluid Chemistry											
Sub-Attribute Details											
	Select	Grade	Description	Wt	Comments	E	D	C	B	A	
1 pH	Character:	4.5 - 5.6 OR 8.4 - 10	C	Challenging.	3	"C" was chosen based on documents suggesting the field to be acidic. Specific numbered scale has not been located. (Davatzes and Hickman, 2010)					
	Activity:	-	-	Information unknown/not tested at this time.	-						
	Execution:	Third Party Results	C	Results taken from previous Third Party studies of the area (either literature of contractors) with little or limited information on survey methods, replication, or error.	3						
2 Corrosive Gas Content	Character:	-	-	Information unknown/not tested at this time.	-						
	Activity:	-	-	Information unknown/not tested at this time.	-						
	Execution:	-	-	Information unknown/not tested at this time.	-						
3 Non-condensable Gas Content	Character:	> 5 wt%	E	Inefficient.	1	"NCG account for 6% of the gas fraction, 98% of that from CO2" (en.openei, 2017)					
	Activity:	-	-	Information unknown/not tested at this time.	-	Activity not provided.					
	Execution:	Third Party Results	C	Results taken from previous Third Party studies of the area (either literature of contractors) with little or limited information on survey methods, replication, or error.	3						
4 Bicarbonate Content	Character:	-	-	Information unknown/not tested at this time.	-						
	Activity:	-	-	Information unknown/not tested at this time.	-		Chart Area				

GeoRePORT Tools: Input Spreadsheet



Geological Overview

Category Summary

Volume	Character Grade		Activity Index		Execution Index	
	Grade	Weighted Ranking	Index	Weighted Ranking	Index	Weighted Ranking
1. Volume	A	10	-	-	-	-
Area	-	-	D	4	C	3
Thickness	-	-	C	6	B	4
TOTALS:	A	10	d	5	c	3.5

Temperature	Character Grade		Activity Index		Execution Index	
	Grade	Weighted Ranking	Index	Weighted Ranking	Index	Weighted Ranking
1. Temperature	A	5	A	5	C	3
TOTALS:	A	5	a	5	c	3

Fluid Chemistry	Character Grade		Activity Index		Execution Index	
	Grade	Weighted Ranking	Index	Weighted Ranking	Index	Weighted Ranking
1. pH	C	3	-	-	C	3
2. Corrosive Gas Content	-	-	-	-	-	-
3. Non-Condensable Gas Content	E	1	-	-	C	3
4. Bicarbonate Content	-	-	-	-	-	-
5. Total Dissolved Solid Content	C	3	B	4	C	3
6. Silica Content	B	4	C	3	C	3
TOTALS:	D	11	d	7	c	12
Total Dissolved Solid *	C		B		C	

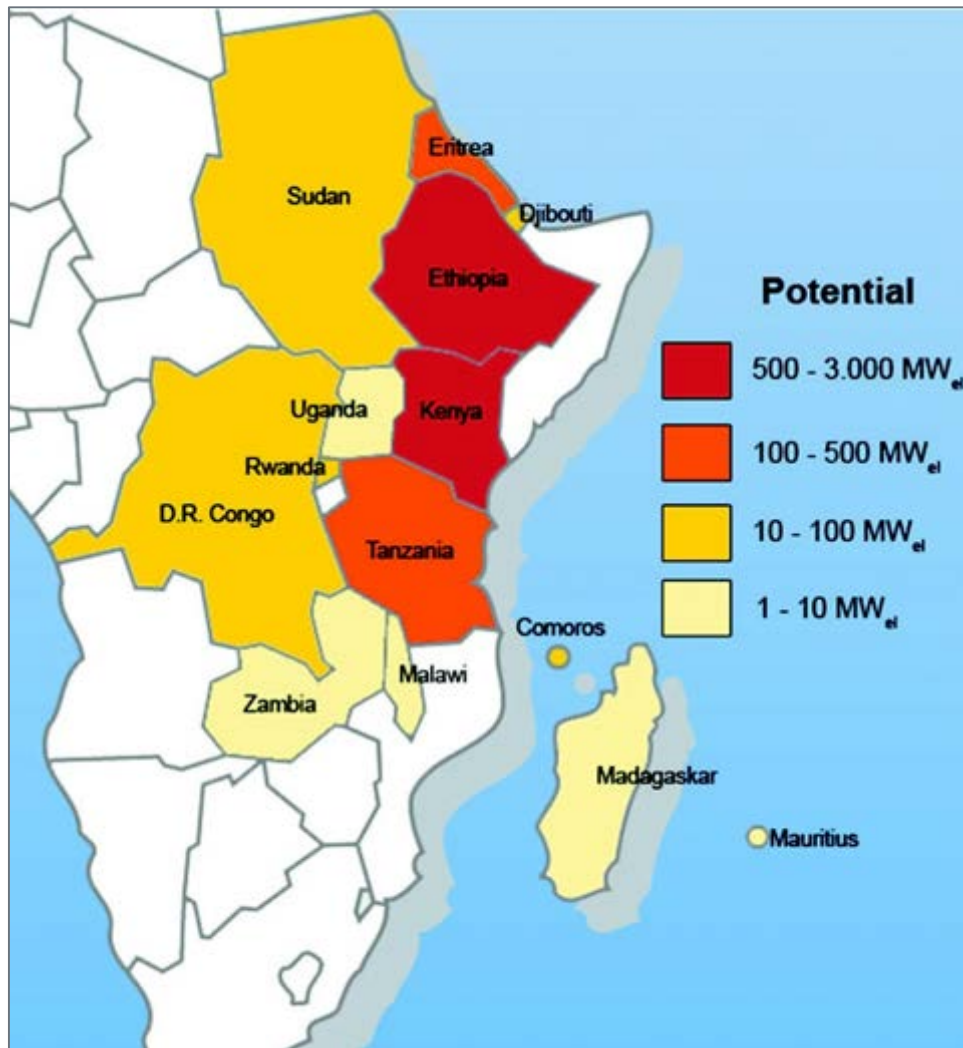
Permeability	Character Grade		Activity Index		Execution Index	
	Grade	Weighted Ranking	Index	Weighted Ranking	Index	Weighted Ranking
1. Fault/Fracture Orientation	B	4	B	4	C	3
2. Fault/Fracture Aperture	C	3	D	2	C	3
3. Mineralization	C	3	B	4	C	3
4. Fracture Spacing	-	-	-	-	-	-
5. Fracture Roughness	-	-	-	-	-	-
TOTALS:	D	10	d	10	d	9
Fault/Fracture Orientation *	B		B		C	

*Note: Scientist determined the designated sub-attribute has the most impact on the reservoir's attribute.

GeoRePORT Tools: Input Spreadsheet

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	
1	Reservoir Site: Coso Geothermal Area - California, USA																		
3	Completed By:	Melinda St. Onge						Print Report			Print Condensed Report								
4	Date Completed:	4/6/17																	
6	Opening Remarks																		
8	This report has been conducted by a third-party non-geoscientist. Based on public records and available technical reports the following should be noted: (1) This is a case study test of the GeoRePORT and how well it represents the provided data. (2) Many conducted research activities were difficult to appropriately categorize and therefore may have been given higher or lower representative grades. (3) Missing information does not mean tests have not been conducted. (4) This report is in no way a complete cross-examination of the resource, the information in this report will change provided project experts input.																		
13	Reservoir Description																		
15	The Coso Geothermal Field is located in Inyo County, California, within the Naval Air Weapons Station at China Lake and in the northern region of the Mojave Desert. The entirety of the site is approximately 510 acres. The Coso Geothermal Field has been producing geothermal electricity power continuously since 1987. The field contains several divisions and power plants. Navy 1, Navy 2, and BLM are site locations with existing operational power plants. The Northern frontier is still in exploratory phases.																		
20	Attribute Overview																		
21																			
51	Attribute Summary																		
	<div style="display: flex; justify-content: space-between; align-items: center;"> ◀ ▶ 🔒 Cover Page 🔒 Project Readiness 🔒 GeoSummary 🔒 Temperature 🔒 Volume 🔒 Fluid Chemistry 🔒 Permeability </div>																		

Applicability to Africa

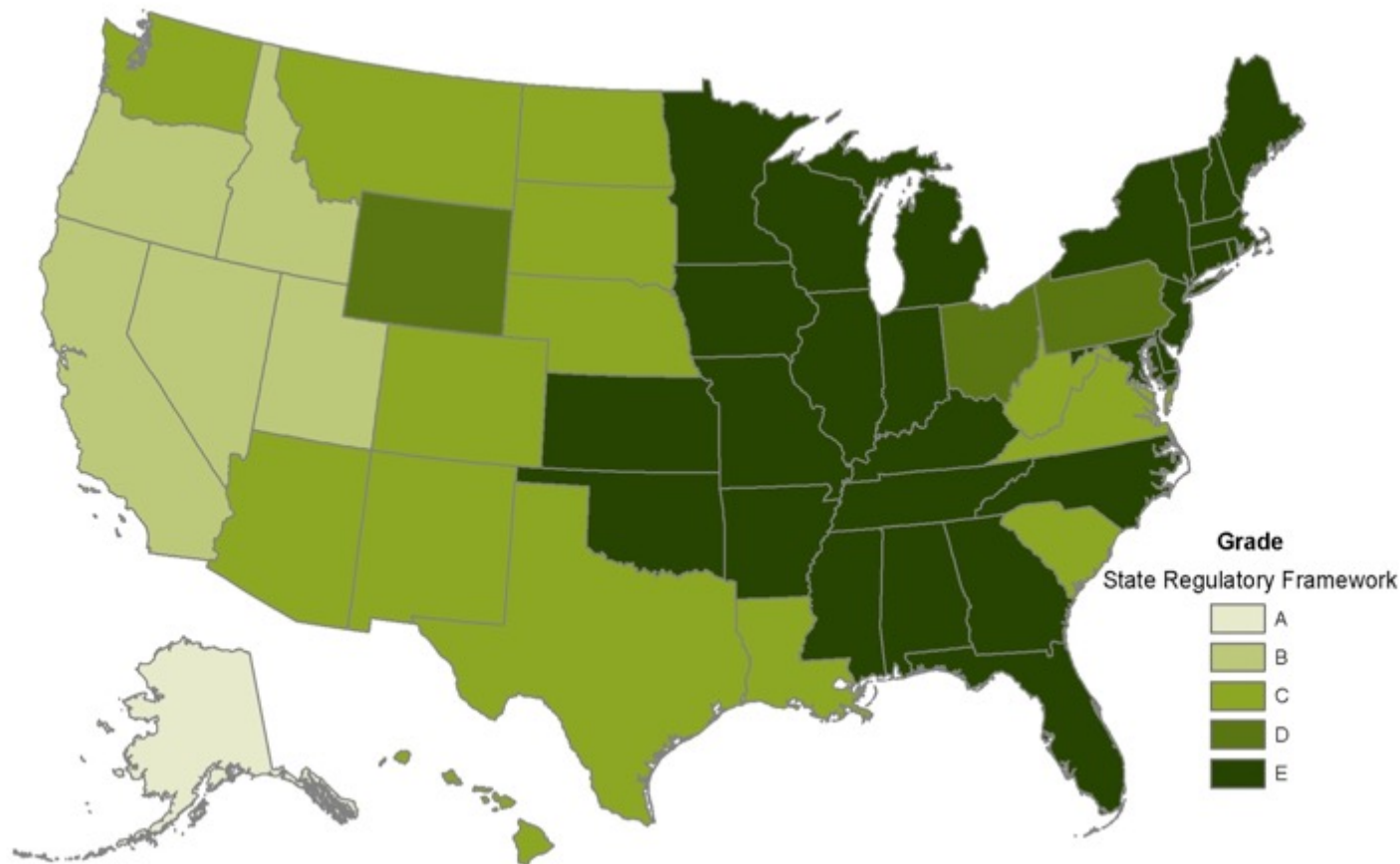


- How certain are we of the geothermal potential in E. Africa?
- What gaps exist in the data that need to be filled to attract investors to develop here?
- How much of this geothermal potential is developable?
- What are the biggest challenges to development?
- How do regulations and policies in E. Africa compare to those in other parts of the world?
- If countries wanted to improve their regulations/policies to attract investors, what could they do?

Example Sub-Attribute Map

Attribute: Permitting

Sub-Attribute: State Regulatory Framework



A State/County has a permit coordinating office, geothermal regulations and experience successfully permitting projects

B State/County has geothermal regulations and experience successfully permitting projects

C State/County has geothermal regulations, but has not successfully permitted a project or is in the process of changing the regulations

D State/County has a definition of geothermal resources, but does not have permitting regulations

E State/County does not have any geothermal power regulations

Using GeoRePORT to Indicate Certainty

Temperature

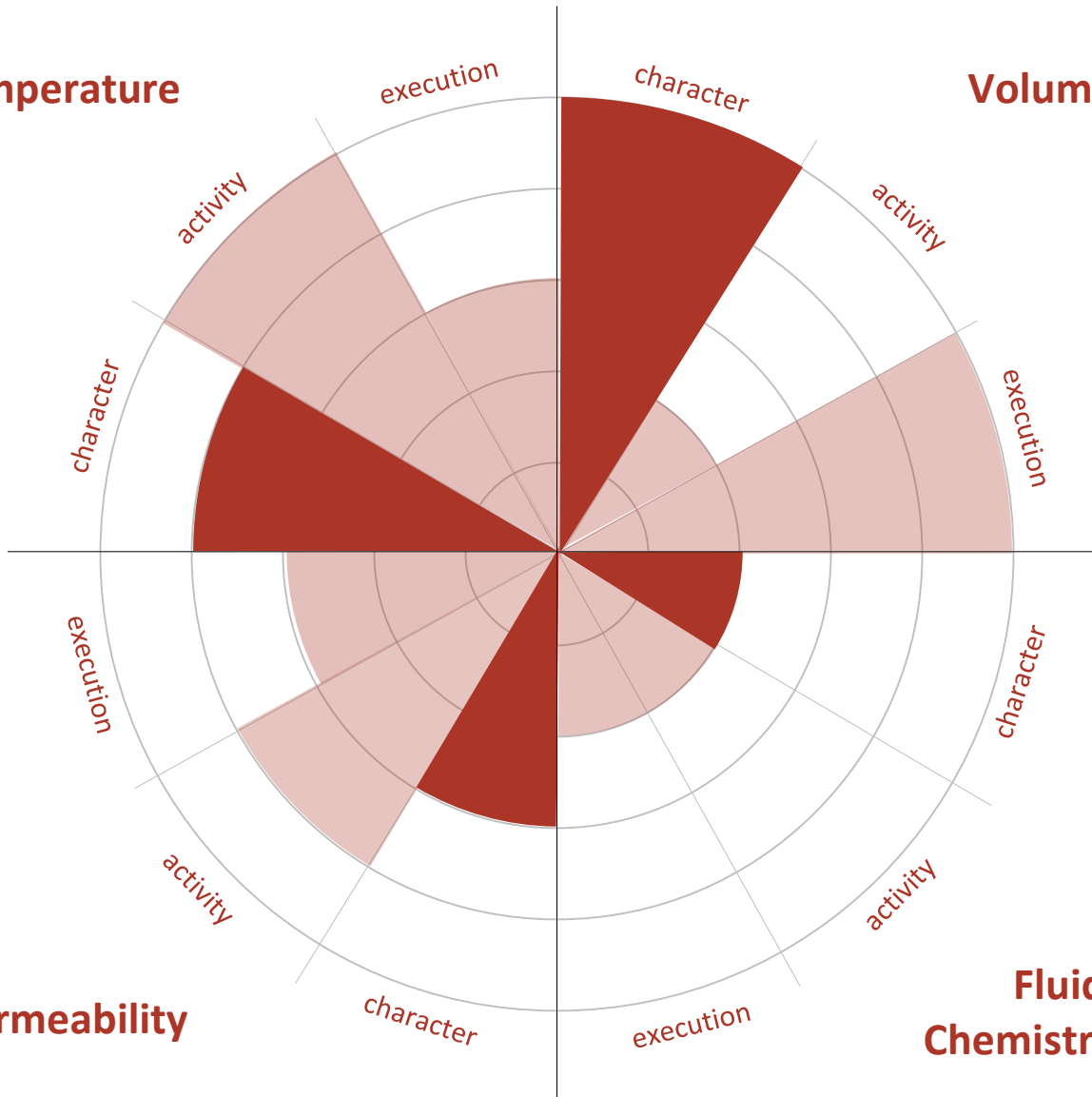
Volume

**Resource Grade
Polar Area Chart**

The bigger the pie piece, the better the attribute grade

Dark Wedges
indicate grade

Light Wedges
indicate certainty



Using GeoRePORT to Indicate Certainty

Temperature

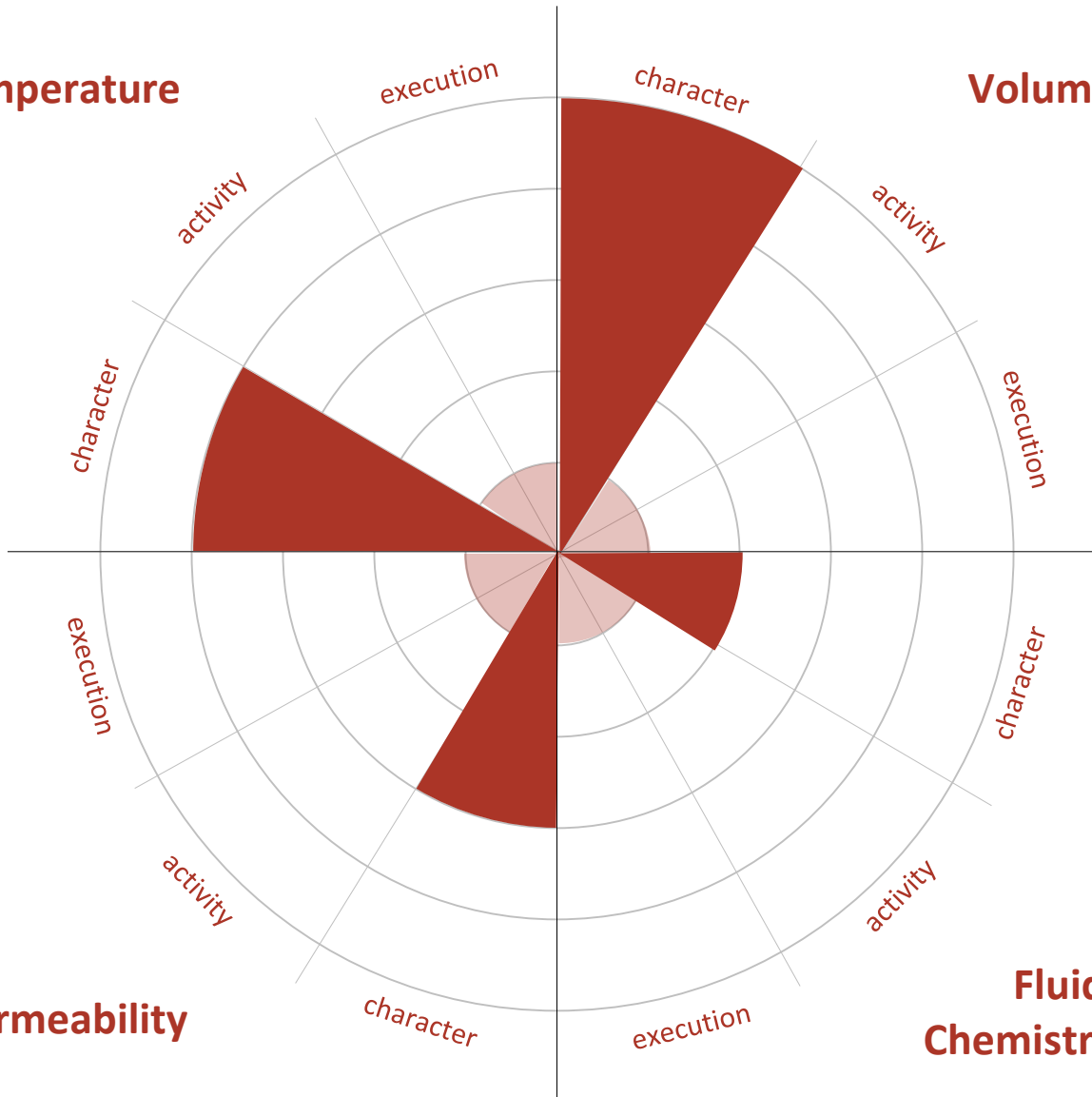
Volume

**Resource Grade
Polar Area Chart**

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Dark Wedges
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Light Wedges
indicate certainty



Applicability to Africa



Olkaria III Geothermal Plant in Kenya by Ormat (source: ThinkGeoEnergy)

- GeoRePORT may help investors be able to better calibrate their risk premium to the geologic uncertainty.
- GeoRePORT was intended to be filled out by the experts (geological, permitting, power plant designers) involved in each project – not by a third party. This way, reported data are more accurate – and remain confidential.
- The GeoRePORT Protocols and Input worksheet are available for free

Socio-Economic Attributes

Sub-attribute	Weight
Cultural and Tribal Resources	3
Environmentally Sensitive Areas	3
Biological Resources	3
Land Ownership	2
Federal and State Lease Queue	1
Military Installation	1

Land Access

Sub-attribute	Weight
Policies	2
Incentives	2
Market Demand	1
Wholesale Price of Electricity	1

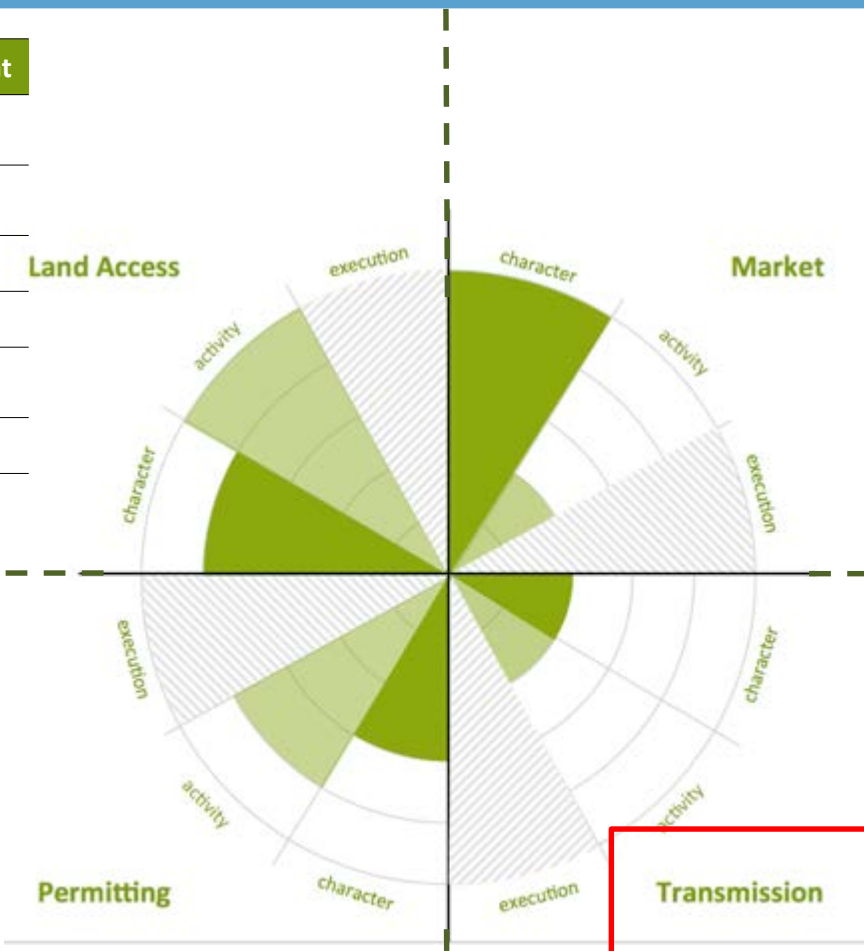
Market

Permitting

Sub-attribute	Weight
Environmental Review Process	3
Regulatory Framework	2
State Regulatory Framework	
Federal Regulatory Framework	
Ancillary Permits	1

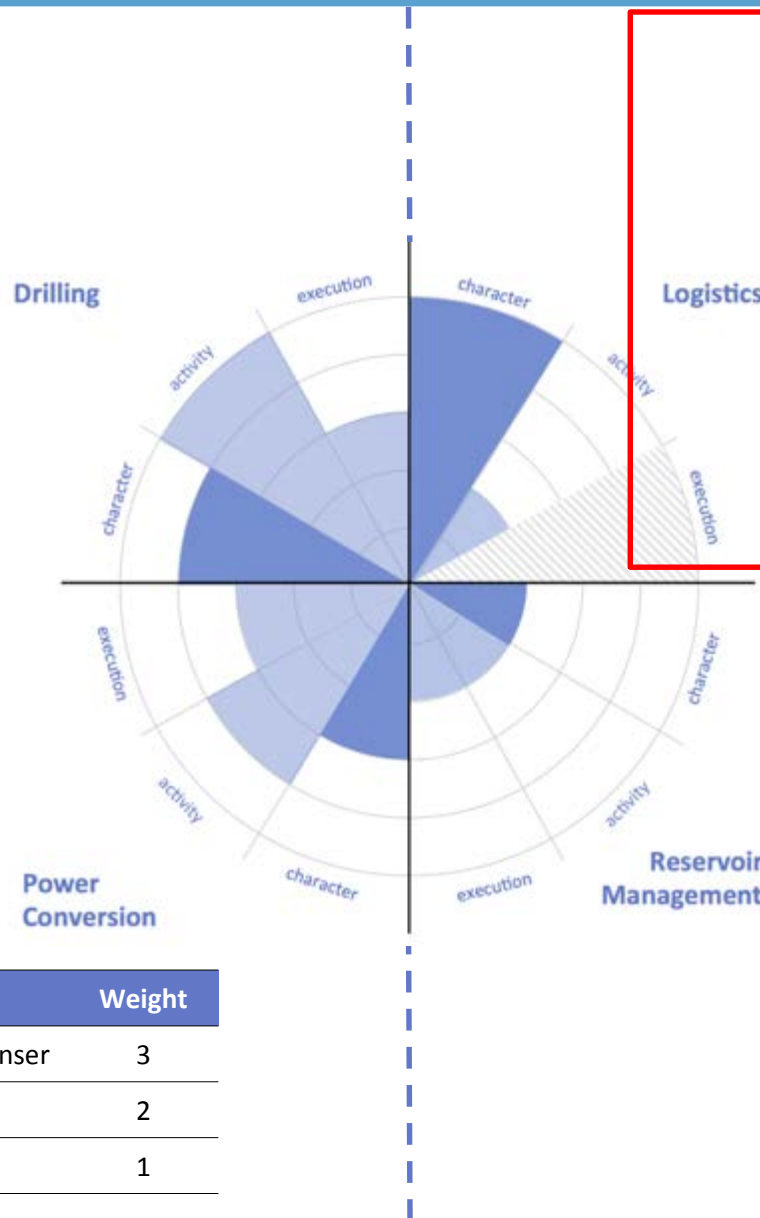
Transmission

Sub-attribute	Weight
Distance to the nearest transmission line	1
Interconnection costs	1
Transmission (wheeling) costs	1



Technical Attributes

Sub-attribute	Weight
Well Depth	3
Drilling Experience in Area	2
Bottom-hole Diameter	1
Temperature	1
Wellbore Control	1
Anticipated Rig Downtime	1
Well Direction	1
Drilling Restrictions	1



Sub-attribute	Weight
Degree of Isolation	2
Site Road Access	2
Volcanic Hazards	2
Landslide Hazards	2
Earthquake Hazards	2
Wildfire Hazards	2
Topography	1
Severe Weather Events	1

Sub-attribute	Weight
Temperature Difference: Inlet to Condenser	3
Water for Cooling	2
Non-condensable gas content	1

Sub-attribute	Weight
System Permeability	3
Storativity	3
Cost of Supplemental Injectant	2
Coldwater Breakthrough	2
Calcite Saturation	1

Thank You!

For more information about GeoRePORT, visit the website at:

<http://en.openei.org/wiki/GeoRePORT>

Or contact me at:

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