SB

243

OUSE COMMITTEE REPOI

(9)

Date Referred to Committee: April 6, 2010 **FURTHER REFERRALS: Labor and Commerce, Finance**

Date of Committee Action: 9 Apr 2010

The RESOURCES Committee considered: **CS FOR SENATE BILL NO. 243(FIN)**

"An Act relating to geothermal resources; relating to the royalty obligation for geothermal resources; transferring from the Department of Natural Resources to the Alaska Oil and Gas Conservation Commission authority over permitting and inspection of geothermal wells; providing for a regulatory cost charge for geothermal wells; and providing for an effective date."

SB 243-GEOTHERMAL RESOURCE:ROYALTY/PERMIT/FEE

Recommends it be replaced with [✓] HCS *or* **[ ] CS** *for* CSSB 243 (Res)

For Senate Bills with new title: [ ] Technical Title [ ] New Title: HCR_____ [✓] Same Title [ ] New Title

[ ] attach amendments
[ ] add new referral to _____Committee
[ ] Letter of Intent_____Committee

List of Abbrev for Depts.:
ADM
CED
COR
CRT
EED
DEC
DFG
GOV
DHS
LWF
LAW
LEG
MVA
DNR
DPS
REV
DOT
UA

***NEW* FISCAL NOTES**
*Assigned by Chief Clerk's Office

List by Dept(s):	*FN#	Fiscal	Indet.	Zero

***PREVIOUS* FISCAL NOTES**

List by Dept(s):	FN#	Fiscal	Indet.	Zero
ADM	4			✓
DNR	3			✓
REV	2			✓

Signing with recommendations	Printed Last Name	DP	DNP	NR	AM
	Edgmon	X			
	Olson	X			
Chair:	Johnson	X			
Chair:					

ALASKA STATE LEGISLATURE

Session
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Juneau, Alaska 99801-1182
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Interim
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SENATOR LESIL MCGUIRE

Sectional Analysis of Senate Bill 243: 26-LS 1346\PS

Please note that a sectional analysis is not an authoritative interpretation of a bill. The bill itself is the best statement of its contents.

Section 1 amends AS 31.05.030 clarifying that the Alaska Oil and Gas Conservation Commission (AOGCC) has jurisdiction over the exploration and development of geothermal resources; except for the management of leases and units.

Section 2 amends the royalty rate for geothermal resources in AS 38.05.181(g) to reflect federal royalty rates; 1.75% of gross income during the first 10 years and 3.5% of gross income thereafter.

Section 3 adds a new section to AS 41.06 delineating jurisdiction over geothermal resources between the AOGCC and Department of Natural Resources (DNR).

Section 4 amends AS 41.06.010 to allow the AOGCC to investigate the waste of geothermal resources.

Section 5 repeals and reenacts AS 41.06.020 to set out the jurisdiction of the AOGCC over all land in the state and to allow for the suspension of the application of chapter 06 on federal land if similarly regulated by Federal government and clarifies the application of the chapter.

Section 6 amends AS 41.06.030(a) to clarify that a plan of development and operation for a geothermal resource must be filed with the AOGCC.

Section 7 amends AS 41.06.030(b) to clarify that unitization by DNR of a geothermal resource system under AS 41.06.030 when the geothermal resource system includes state land.

Section 8 amends AS 41.06.030(c) to conform to the changes made in section 7.

Section 9 amends AS 41.06.030 by inserting a new subsection (e) that allows the commissioner of DNR to adopt regulations necessary to implement the purposes and intent of chapter 6.

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Section 10 amends AS 41.06 by adding a new section 41.06.035 allowing the AOGCC to issue orders and impose requirements to prevent waste and protect correlative rights on any geothermal opeation. This section also allows the AOGCC to adopt regulations.~~regulate the management of a geothermal resource~~.

Section 11 repeals and reenacts AS 41.06.040(a) governing the authority of the AOGCC to adopt regulations governing the safe development~~management~~ of a geothermal resource.

Section 12 amends AS 41.06.040 (b) ~~by replacing the commissioner of DNR's authority governing the filing of a surety bond with the AOGCC.~~to allow the AOGCC to require a geothermal operator to file a surety bond.

Section 13 amends AS 41.06.040(c) to require notification of the AOGCC rather than the DNR is geothermal exploration encounters hydrocarbons and other fissionable materials.

Section 14 amends AS 41.06.040(d) to replace the commissioner of DNR with the AOGCC for the purposes of authorizing inspection of a geothermal operation.

Section 15 repeals and reenacts AS 41.06.050 governing the AOGCC permitting process for geothermal exploration and development drilling.

Section 16 amends AS 41.06 by adding a new section 41.06.055 authorizing a regulatory cost charge for geothermal wells.

Section 17 repeals and reenacts AS 41.06.060 providing definitions for AS 41.06

Section 18 repeals AS 41.06.030(d) governing lease operations under an approved plan of development and AS 41.06.040(e) the exemption from AOGCC authority of geothermal resources.

Section 19 adds a new section to the uncodified law of the State of Alaska that applies the royalty rates established by section 2 to leases entered into or renewed after the effective date of the act and directs the commissioner of DNR to offer the royalty rates established by section 2 to an existing lessee.

Section 20 adds a new section to the uncodified law of the State of Alaska that governs the transition of authorities over geothermal resources established in this act.

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SENATOR LESIL MCGUIRE

Section 21 adds a new section to the uncodified law of the State of Alaska that gives direction to the revisor of statutes.

Section 22 immediate effective date for section 20

Section 23 effective date of July 1, 2010

Prepared By: Michael Pawlowski, Aide to Senator McGuire

FISCAL NOTE

STATE OF ALASKA
2010 LEGISLATIVE SESSION

Fiscal Note Number: 3
Bill Version: CSSB 243(FIN)
(S) Publish Date: 4/2/10

Identifier (file name): CSSB243(FIN)-DNR-DOG-03-31-10
Title: No Royalty on Geothermal Resources
Sponsor: Sen McGuire
Requester: SFIN

Dept. Affected: Natural Resources
RDU: Resource Development
Component: Oil and Gas Development
Component Number: 439

Expenditures/Revenues (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

	Appropriation Required	Information					
OPERATING EXPENDITURES	**FY 2011**	**FY 2011**	**FY 2012**	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**
Personal Services							
Travel							
Contractual							
Supplies							
Equipment							
Land & Structures							
Grants & Claims							
Miscellaneous							
TOTAL OPERATING	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
CAPITAL EXPENDITURES							
CHANGE IN REVENUES ( )							

FUND SOURCE (Thousands of Dollars)

1002 Federal Receipts							
1003 GF Match							
1004 GF							
1005 GF/Program Receipts							
1037 GF/Mental Health							
Other Interagency Receipts							
TOTAL	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Estimate of any current year (FY2010) cost:

POSITIONS

Full-time							
Part-time							
Temporary							

ANALYSIS: *(Attach a separate page if necessary)*

Under AS 38.05.181(g) SB 243 reduces royalty on gross revenues from 10% under current lease conditions to 1.75% of the gross revenues derived from geothermal leases during the first 10 years of income generating production on state leased lands, with a 3.5% royalty rate thereafter. These royalty rates apply to a geothermal lease or the renewal of a geothermal lease entered into on or after the effective date of the Act.

Given the immature state of the geothermal industry in Alaska, the impact to royalty revenue is indeterminate. Although a reduced royalty rate will lead to less royalty collected for a given geothermal project, this reduced royalty rate may make geothermal projects on state lands more competitive. This bill will also transfer certain drilling inspection functions and other authorities to AOGCC. There will be no budget impact to DNR as a consequence of this transfer. Without SB 243 DNR must either hire or contract drilling engineers and inspectors to meet the potential demand of geothermal leasing.

Sec. 17 (d) defines those waters where the Division of Mining, Land and Water will continue to manage water rights in the state when the water is not a "geothermal resource."

Prepared by: Kevin Banks — Phone 269-8800
Division: Oil and Gas — Date/Time 3/31/10 1:00 PM
Approved by: Tom Irwin — Date 3/31/10 5:15pm
Natural Resources

(Revised 11/6/2009 OMB)

FISCAL NOTE

STATE OF ALASKA
2010 LEGISLATIVE SESSION

Fiscal Note Number: 4
Bill Version: CSSB 243(FIN)
(S) Publish Date: 4/2/10

Identifier (file name): SB243CS -DOA-AOGCC-03-31-10
Dept. Affected: Admin
Title "An Act relating to the royalty obligation for geothermal resources."
RDU AOGCC
Component AOGCC
Sponsor Senator Lesil McGuire
Requester (S) FIN
Component Number 2010

Expenditures/Revenues (Thousands of Dollars)

Note: Amounts do not include inflation unless otherwise noted below.

	Appropriation Required	Information					
OPERATING EXPENDITURES	**FY 2011**	**FY 2011**	**FY 2012**	**FY 2013**	**FY 2014**	**FY 2015**	**FY 2016**
Personal Services	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Travel	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Contractual	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Supplies	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Equipment	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Land & Structures	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Grants & Claims	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Miscellaneous	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TOTAL OPERATING	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**
CAPITAL EXPENDITURES							
CHANGE IN REVENUES ( )							
FUND SOURCE		(Thousands of Dollars)					
1002 Federal Receipts	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1003 GF Match	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1004 GF	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1005 GF/Program Receipts	0.0	0.0	0.0	0.0	0.0	0.0	0.0
1037 GF/Mental Health	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Other Interagency Receipts		0.0	0.0	0.0	0.0	0.0	0.0
TOTAL	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**	**0.0**

Estimate of any current year (FY2010) cost: 0.0

POSITIONS

Full-time							
Part-time							
Temporary							

ANALYSIS: *(Attach a separate page if necessary)*

Additional work for the Alaska Oil and Gas Conservation Commission (AOGCC) resulting from this bill could be managed by existing staff. The agency would need to provide training for Commissioners and staff on geothermal drilling and production practices, but the costs would be absorbed by the agency. Therefore, AOGCC submits a zero fiscal note.

Prepared by: Jody J. Colombie, Special Assistant I
Phone (907 793-1221
Division Alaska Oil and Gas Conservation Commission
Date/Time 3/31/10 10:00 AM
Approved by: Rachael Petro, Deputy Commissioner
Date 3/31/2010
Department of Administration

(Revised 11/6/2009 OMB)

Geothermal State Leasing

(Taken from www.geothermal.org)

Alaska

Legislative Reference: Alaska Administrative Code 41.06.40 – 41.06.60; Alaska Statutes - Alaska Public Lands Act, Section 38.910, Section 38.05.181 – 38.05.182

Agency Responsible for Leasing: Department of Natural Resources Division of Lands

Leasing: Leasing is by competitive bid in areas designated by the Commissioner of the Department of Natural Resources. On state land that has not been declared a competitive geothermal area or withdrawn from geothermal prospecting, the commissioner may issue a prospecting permit to the first qualified bidder. Upon discovery of geothermal resources in commercial quantities the permit maybe converted to a noncompetitive lease.

Lease Terms:

Primary: 10 years
Renewal: 5 years if engaged in drilling and thereafter for duration of commercial production
Rentals: $3.00 per acre per year
Royalties: 10 – 15 % of gross revenue derived for products, sale, or use of geothermal resources under the lease. Royalties may be taken in kind if in the best interest of the state.

Arizona

Legislative Reference: Legislative Reference Title 12 Natural Resources Article 22 Geothermal Resource R12-5-2201 to R12-5-2217

Agency Responsible for Leasing: State Land Department

Leasing: Leasing is by competitive bid

Lease Terms:

Primary: 10 years
Renewal: As long as production is maintained
Rentals: $1.00 per acre per year
Royalties: Not less than 12.5 % of the market value

California

Legislative Reference: California Public Resource Code 6901-6925.2

Agency Responsible for Leasing: State Lands Commission

Leasing: Leasing is by competitive bid in areas selected for lease by the commission. Prospecting permits are available and may be convertible to a lease upon discovery with such terms as specified in 6913.

Lease Terms:

Primary: 10 years
Renewal: Yes, for so long as geothermal resources are being or capable of being produced or utilized in commercial quantities
Rentals: $1.00 per acre per year escalating, or prospecting permit
Royalties: Not less than 10 % of gross revenue
Not less than 20 % of gross revenue of mineral products
The Commissioner may provide for a royalty of less than 10 % for direct heat applications.

Colorado

Legislative Reference: Colorado Statutes Title 36 Natural Resources 36-1-115 Development of oil, gas, or geothermal resources areas.
36-1-147 Geothermal Leases.

Agency Responsible for Leasing: State Board of Land Commissioners

Leasing: Leases issued by the State Board of Land Commissioners may be awarded as the result of negotiation or competitive bidding. 36-1-113 (2)

Lease Terms:

Primary: Set in lease
Renewal: For as long as production continues
Rentals: Set in lease
Royalties: Set in lease

Hawaii

Legislative Reference: Hawaii Administrative Rules Title 13 Department of Land and Natural Resources Subtitle 7 Water and Land Development Chapter 183 Rules on Leasing and Drilling Geothermal Resources

Agency Responsible for Leasing: Department of Land and Natural Resources
Leasing: Leases on state land shall be granted only on a competitive bid basis. Leasing on reserved land may be granted on a competitive bid basis by public auction or without auction to the occupier or to his assignee upon a vote of two-thirds of the Board members. Exploration permits are also available on any state or reserved land.

Lease Terms:
Primary: 10 years
Renewal: For up to a maximum of 65 years
Rentals: Set by Board
Royalties: Determined by the Board
Royalties on by-products not less than 5 %

Idaho

Legislative Reference: Idaho Statutes Title 47 Mines and Mining Chapter 16 Geothermal Resources 47-1601 to 47-1611 Administrative Code 20.03.15 to 20.03.120

Agency Responsible for Leasing: State Board of Land Commissioners

Leasing: Leasing is by competitive bid in areas designated by the Director of the Department of Lands as being in a Known Geothermal Resource Area (KGRA) or where there is competitive interest, i.e. two or more applications are received on the same day for the same site. Other areas are available on a noncompetitive basis.

Lease Terms:
Primary: 10 years
Renewal: The primary term can be extended if lessee is actively engaged in drilling once geothermal resources are proved or utilized in paying quantities. The lease shall be extended but in no event for more than 40 years. After the end of the primary term, the lessee has preferential right to renewal for a second 40 years.
Rentals: $1.00 per acre per year – first five years
$2.00 per acre per year – second five years
$3.00 per acre per year – thereafter
Royalties: 10 % of the amount of value of geothermal resource, 5 % of the associated byproducts.

Kansas

No leasing regulations for geothermal.

Montana

Legislative Reference: Montana Code Annotated 2001 **77**-4-101 to **77**-4-109, 77-4-121 to 77-4-129; Administrative Rule of Montana 36.25.103 and 104; Subchapter 4 Geothermal Rules and Regulations 36.25.401 to 36.25.413

Agency Responsible for Leasing: Board of Land Commissioners

Leasing: All leasing is by competitive bid. If at the lease sale, no bid is made on the tract for which an application was made, the applicant may negotiate with the Board.

Lease Terms:

Primary: 10 years

Renewal: The lease will continue in effect beyond the primary ten years if the lessee is engaged in drilling for geothermal resources. The lease shall continue in force so long as geothermal resources in paying quantities are produced.

Rentals: $1.00 per acre per year

Royalty: 10 % of the gross revenue; minimum $2.00 per acre per year

Nebraska

Legislative Reference: Nebraska State Statutes Section 66-1101 to 66-1106

Nebraska has not developed any provisions for leasing of state lands for geothermal exploration and development. However, for minerals as well and oil and gas, leasing competition is by competitive auction.

Nevada

Legislative Reference: Nevada Revised Statutes 534A.010; 534A.050

No leasing regulations for geothermal development.
For leasing, see Lands, Contract Department.

New Mexico

Legislative Reference: New Mexico Annotated Code Title 19 Chapter 14-1; Title 19 Chapter 2-7; Title 19 Chapter 13-7 to 13-12

Agency Responsible for Leasing: New Mexico State Lands Office

Leasing: Leases are available on a non-competitive basis. However, the Commissioner of Public Lands may at his discretion reject any application and offer the tract or tracts at public auction. Lands classified as "known geothermal fields" are leased through public auction through either sealed or oral bidding procedure.

Lease Terms:

Primary: 5 years

Renewal: Primary term can be renewed for additional 5 years and thereafter so long as geothermal resources are being produced or utilized or are capable of being produced or utilized in commercial quantities.

Rentals: $1.00 per acre or fraction thereof per year. Escalates to $5.00 per acre per year after primary lease term.

Royalties: 10 % of the gross revenue from the sale or use of steam, brines or hot water, associated gases or other forms of heat or energy derived from production with a minimum of $2.00 per acre or fraction thereof per year.
A royalty of not less than 2 % nor more than 5 % of the gross revenue received for the sale of mineral products or chemical compounds recovered from geothermal fluids.
A royalty of 8 % of the net revenue for the operation of an energy producing plant on the leased land.
A royalty of not less than 2 % nor more than 10 % of the gross revenue received from the operation of the geothermal resource for recreational, space heating, or health purposes.

North Dakota

Legislative Reference: North Dakota Century Code Chapter 38-19

Agency Responsible for Leasing: The State Industrial Commissioner – Office of the State Geologist

Leasing: Leases are negotiated.

Oklahoma

Legislative Reference: Oklahoma Statutes Title 64 Public Lands

Agency Responsible for Leasing: The Land Office

Leasing: The Commissioners of the Land Office have not adopted specific rules and regulations relating to the leasing of school or other public lands for the purpose of geothermal exploration and development.

Oregon

Legislative Reference: Oregon Revised Statues (ORS) Chapters 522 and 273, Oregon Administrative Rules 141-075

Agency Responsible for Leasing: The Division of State Lands

Leasing: Leases are available on both competitive and non-competitive bases. Geothermal exploration permits are also available, but allow only for nonexclusive access to land for geothermal exploration.

Lease Terms:

Primary: 10 years

Renewal: 5 years extension if resource discovery has been made or is imminent. No lease shall exceed 50 years; lessee has right of first refusal in the event the Division decides to continue leasing.

Rentals: Years 1 – 3: $1.00 per acre
Year 4: $3.00 per acre
Years 5 – 10: $5.00 per acre
Renewal geothermal lease: $5.00 per acre

Royalties: A royalty of at least 10 % upon the production value of the geothermal resources produced under the lease and sold or utilized by the lessee. The production value shall be determined by the gross sale price paid by the plant or other purchaser for value.

Royalties on By-Products: 1 % of the gross sale price of de-mineralized water sold, exchanged or otherwise disposed of.

South Dakota

Legislative Reference: South Dakota Codified Laws Chapter 5-1-2, 5-1-7, 5-7-19 to 25

Agency Responsible for Leasing: Department of Schools and Public Lands

Leasing: Leasing is on a competitive basis by public auction; the commissioner retains the right to reject any or all bids.

Lease Terms:

Primary: 10 years

Renewal: So long as resources are produced from the leased lands
Rental: Not less than $1.00 per acre per year.
Royalty: Not less than 10 % of the gross value received from the sale of steam brines at the point of delivery to the purchaser.
A 5 % royalty of the gross revenue from sale of mineral products or chemical compounds recovered from geothermal fluid or chemical compounds.

Texas

Legislative Reference: Texas Natural Resources Code (TNRC) – Title 5 Chapter 141 and Chapter 51.192

Agency Responsible for Leasing: Railroad Commission, Commissioner of the General Land Office

Leasing: All leasing is by competitive bid.

Lease Terms:
Primary: Generally 3-5 years
Renewable: As long as actively pursuing development. Thereafter so long as productive.
Rentals: Established at the time of bid or negotiated thereafter.
Royalties: Established at the time of bid or negotiated thereafter.

Utah

Legislative Reference: Utah Code Section 73-22-1 to 73-22-9, and 59-12-02

Agency Responsible for Leasing: Utah School and Institutional Trust Lands Administration

Leasing: In known geothermal areas lands have been withdrawn and are available for sealed bid competitive leasing upon nomination by a potential lessee. Non-withdrawn lands are available from over-the-counter leasing.

Lease Terms:
Primary: 10 years
Renewable: Primary term extendable if spudding or drilling wells. The lease is extendable indefinitely so long as in production.
Rentals: $1.00 per acre per year escalates to $4.00 per acre per year after expiration of primary lease term.
Royalties: 10% on production or minimum of $4.00 per acre per year.

Washington

Legislative Reference: Revised Code of Washington Chapter 79.76, 79.12, 79.13, 79.01, 79.02, Washington Annotated Code 332-22

Agency Responsible for Leasing: Department of Natural Resources, Division of Lands

Leasing: Leasing may be by competitive bid or negotiation.

Lease Terms:

Primary: 10 years

Renewal: Up to 55 years subject to approval every 5 years upon approval of plan of Development.

Rentals: Years 1 to 5, not less than $1.25 per acre per year or $250, whichever is greater; years 6 to 10, not less than $2.00 per acre per year or $500, whichever is greater.

Royalties: 10 % of the gross proceeds received from the sale of such geothermal resources which are derived, generated or manufactured from the premises sufficient for commercial sales, and 10 % of the fair market value thereof of products utilized but not sold, and 10 % of the gross proceeds for all byproducts derived from the leasehold estate.

Wyoming

Wyoming has never adopted rules and regulations for geothermal leasing. General leasing provisions are found in Wyoming Statutes Title 36 Chapter 5 (36-5-101) Qualification of lessees; lease terms; rental.

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SENATOR LESIL MCGUIRE

Annual Royalty Due Under the SB 243 for the Proposed Mt. Spur Geothermal Project

The following was prepared based on the numbers provided by ORMAT, Inc. to the Senate Resources Committee.

Assumptions:

1. 50 Megawatt Geothermal Project
2. 95% Capacity factor
3. $130 per Megawatt/Hour

At the 1.75% rate for the first 10 years:

- 50 MW x 8760 hrs/yr x 95% CF x $130 MW/hr x 1.75% = $946,627.50 annually

At the 3.5% rate (effective in perpetuity after the first 10 years):

- 50 MW x 8760 hrs/yr x 95% CF x $130 MW/hr x 3.5% = $1,893,255 annually

*It is important to note that if the Mt. Spur project is developed by a private entity as proposed, the corporation would also be subject to Alaska's corporate income tax.

Prepared by: Michael Pawlowski, Aide to Senator McGuire

Debra Higgins

From: Foerster, Catherine P (DOA) [cathy.foerster@alaska.gov]
Sent: Tuesday, April 06, 2010 3:43 PM
To: Rep. Craig Johnson
Cc: Seamount, Dan T (DOA); Norman, John K (DOA)
Subject: SB243

Good afternoon Representative Johnson,

SB243 is floating around in the House right now. There is a portion on royalty rates and a portion transferring some authorities from DNR to AOGCC.

The AOGCC has no opinion on the royalty piece, but here are our thoughts on the portion of SB243 relating to transferring authority from DNR to AOGCC:

The bill transfers some, but not all authorities for regulating geothermal operations from the DNR to the AOGCC. The authorities transferred are the authority to regulate drilling and production operations, the authority to protect correlative rights, and the authority to prevent physical waste of the resource. The DNR retains all of its authorities as a landowner.

The authorities being transferred to AOGCC are consistent with regulatory authorities already held by the AOGCC for oil and gas operations.

The AOGCC already has in place the expertise to allow us to take on these authorities. Most importantly, we have experienced drilling engineers who know what to look for when approving a drilling or well work permit to ensure safety and good operational practices. And we have experienced field inspectors who know what safety equipment is needed and how to test that equipment to demonstrate that it operates properly.

Since we already have the appropriate staff in place, there will be no fiscal impact by making this transfer of authority. However, if this bill does not pass, it will likely cost the State money for the DNR to hire or contract the needed expertise I described above.

Also, this change in authority is consistent with the way geothermal operations are regulated in other states. The only states that have an agency other than their oil and gas regulatory agency overseeing geothermal are Idaho and Utah – which are not oil producing states.

One last comment: The AOGCC's costs are paid by the industry we regulate, through a regulatory cost charge. This bill recognizes that fact, and establishes that geothermal producers will participate in that cost charge, similarly to the way that oil and gas producers do. I.e., during exploration there is no charge; only once production commences are charges billed.

If you have any questions, please do not hesitate to send them my way.

Thanks.

ALASKA STATE LEGISLATURE
Senate Resources Committee

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TO: Representative Johnson, House Resources, Co-Chairman

Representative Neuman

FR: Senator Lesil McGuire

RE: Request to Schedule

Dear Representatives Johnson and Neuman,

Please schedule Senate Bill 243: *No Royalty on Geothermal Resource* for a hearing in the Senate Finance Committee at your earliest convenience.

Attached you will find:

1. Sponsor Statement
2. The most current version of the bill: CS SB 243 (FIN) [version 26-LS1346\P]
3. Fiscal Notes
    a. Revenue 4/2/10
    b. DNR 4/2/10
4. Sectional Analysis for CS SB 243 (FIN)
5. The original version of the bill: 26-LS134\A
6. Backup Documents
    a. Royalty Sheet for Senate Finance
    b. Letter of Support from Akutan
    c. Ormat Presentation to Senate Resources
    d. Geothermal Royalty Rates
    e. USGS Geothermal Paper

USGS
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Assessment of Moderate- and High-Temperature Geothermal Resources of the United States

Scientists with the U.S. Geological Survey (USGS) recently completed an assessment of our Nation's geothermal resources. Geothermal power plants are currently operating in six states: Alaska, California, Hawaii, Idaho, Nevada, and Utah. The assessment indicates that the electric power generation potential from identified geothermal systems is 9,057 Megawatts-electric (MWe), distributed over 13 states. The mean estimated power production potential from undiscovered geothermal resources is 30,033 MWe. Additionally, another estimated 517,800 MWe could be generated through implementation of technology for creating geothermal reservoirs in regions characterized by high temperature, but low permeability, rock formations.

Geothermal power plants at The Geysers in northern California. Currently, the United States has an installed and utilized power production capacity of more than 2,500 Megawatts-electric (MWe) from geothermal plants located in Alaska, California, Hawaii, Idaho, Nevada, and Utah. (USGS photograph by Julie Donnelly-Nolan.)

Introduction

The U.S. Geological Survey (USGS) has recently assessed the electric power generation potential of conventional geothermal resources in the United States. These resources are concentrated in the States of Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming, which contain all 241 identified moderate-temperature (90 to 150°C; 194 to 302°F) and high-temperature (greater than 150°C) geothermal systems located on private or accessible public lands. (Geothermal systems located on closed public lands, such as national parks, were not included in the assessment.) Electric-power potential was also determined for seven low-temperature (less than 90°C) systems in Alaska for which local conditions make electric power generation feasible. In addition, the assessment also includes a provisional estimate of the power generation potential from the application of unconventional, Enhanced Geothermal Systems (EGS) technology in Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. This assessment benefited from cooperation and coordination with the Department of Energy (DOE); Bureau of Land Management (BLM); the University of Nevada, Reno; the University of Utah; Idaho National Laboratory; Lawrence Berkeley National Laboratory; state and local agencies; and the geothermal industry.

Identified Geothermal Systems

Currently, the United States has an installed and utilized power production capacity of more than 2,500 Megawatts-electric (MWe) from geothermal plants located in Alaska, California, Hawaii, Idaho, Nevada, and Utah. The nearly 15,000 Gigawatt-hours (GWh) of geothermal power generated in 2005 constituted 25% of domestic nonhydroelectric renewable electrical power generation. (Power generation of 1 MWe provides 8.77 GWh of electricity in 1 year.) The results of the new assessment for the power generation potential from identified geothermal systems yield a mean total of 9,057 MWe

U.S. Department of the Interior
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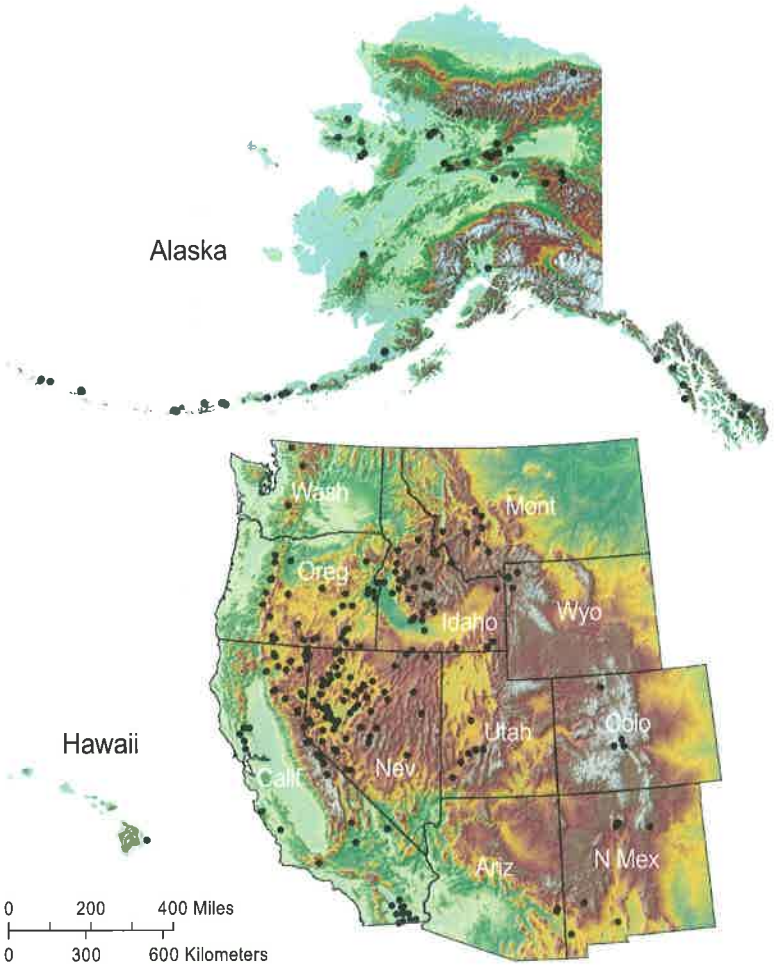

Figure 1. *Map showing the location of identified moderate-temperature and high-temperature geothermal systems in the United States. Each system is represented by a black dot.*

with a 95% probability of 3,675 MWe and a 5% probability of 16,457 MWe (table 1). The distribution of the individual systems across the study area is shown in figure 1. State totals were derived from summations of volumetric models for the thermal energy and electric generation potential of each individual geothermal system (Muffler, 1979; Williams and others, 2008). The results of the assessment indicate that full development of identified systems alone could expand geothermal power production by approximately 6,500 MWe and to seven additional states. The distribution of identified geothermal resources among the 13 states with identified geothermal resources is shown graphically in figure 2A. California, with large producing geothermal fields at The Geysers, the Salton Sea, and Coso, has 59.7% of the total resource, followed by Nevada with 15.4% and Alaska with 7.5%.

Undiscovered Geothermal Resources

Undiscovered geothermal resources were assessed for the same states in which the identified moderate- and high-temperature geothermal systems are located, based on a series of Geographic Information Systems (GIS) statistical models for the spatial correlation of

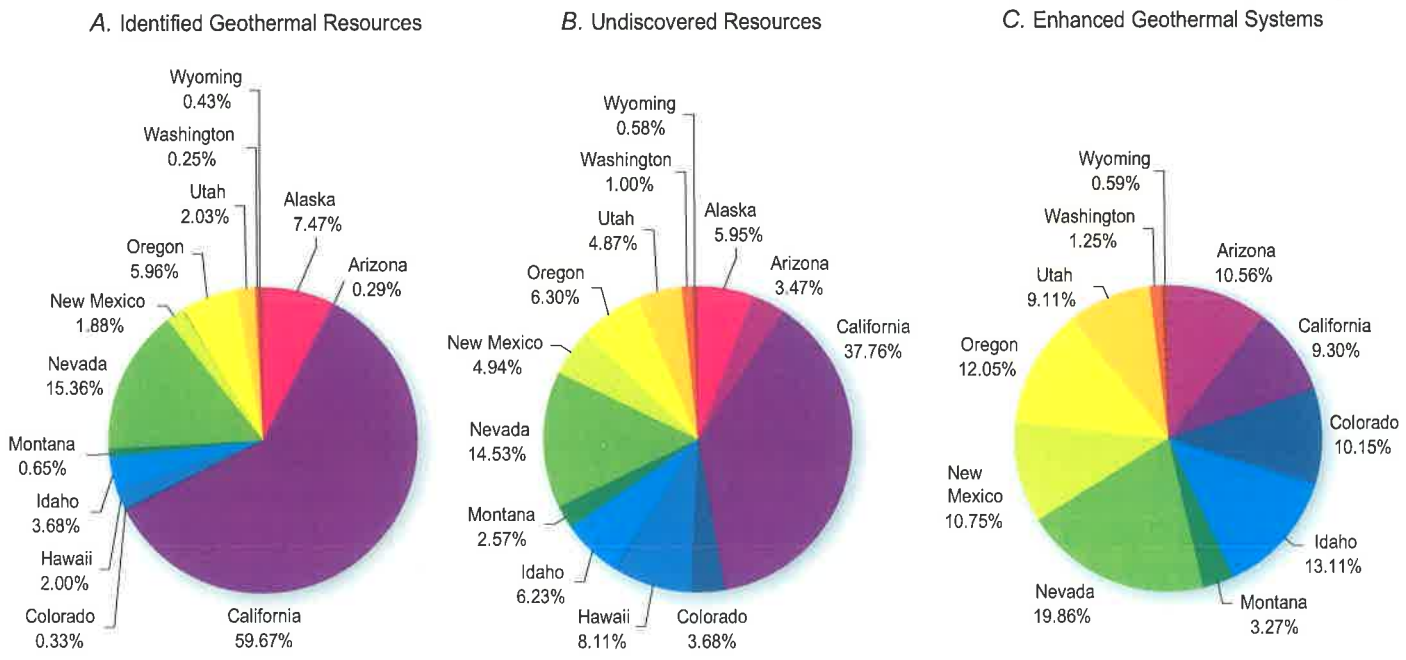

Figure 2. *Pie charts illustrating the distribution of (A) identified, (B) undiscovered and (C) Enhanced Geothermal Systems (EGS) resources (mean estimates) among the western states. Alaska and Hawaii were not included in the assessment of EGS resources because of a lack of information in those states.*

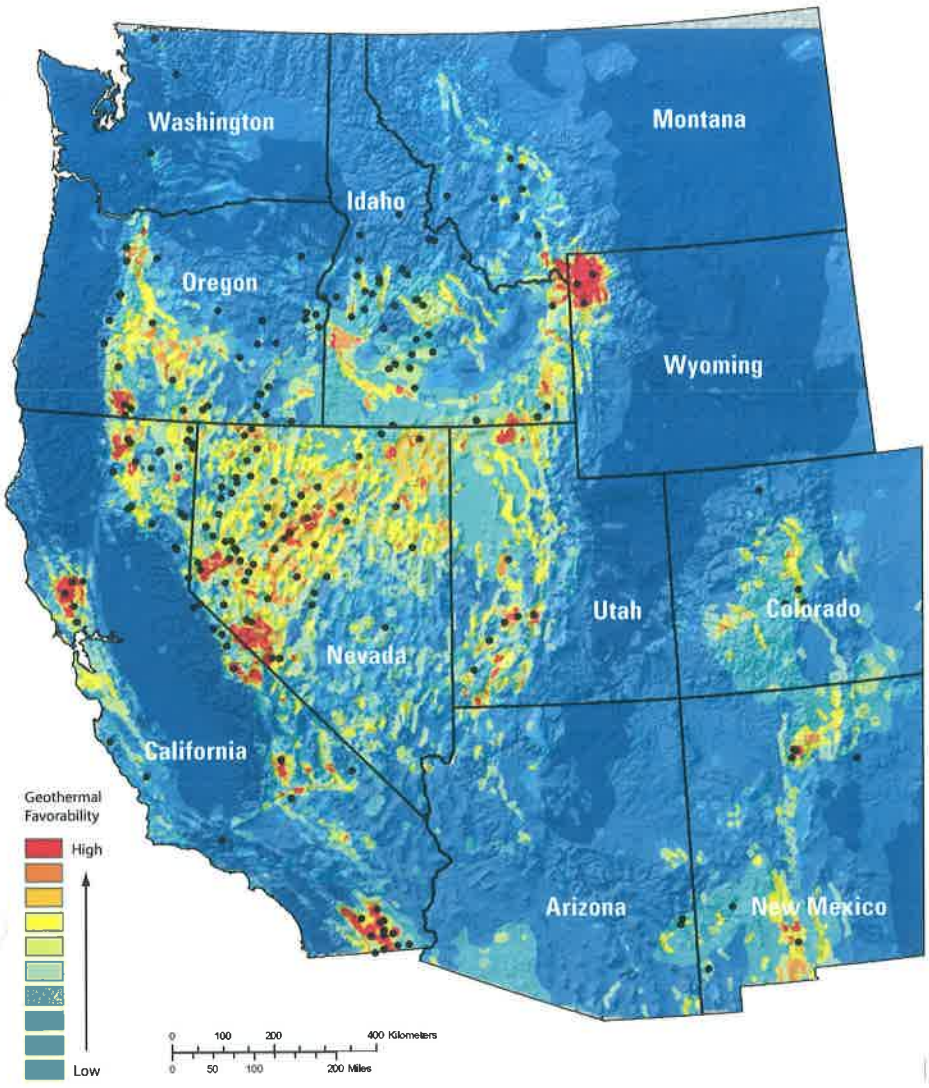

Figure 3. *Example map from one of a series of 28 spatial models showing the relative favorability of occurrence for geothermal resources in the western contiguous United States. The other models differ in details but show generally similar favorability patterns. Warmer colors equate with higher favorability. Identified geothermal systems are represented by black dots.*

geological factors that facilitate the formation of geothermal systems. The mean estimated power production potential from undiscovered resources located on private and accessible public lands is 30,033 MWe, with a 95% probability of 7,917 MWe and a 5% probability of 73,286 MWe. As illustrated in figure 2*B*, compared to the identified resources, a larger fraction of the undiscovered geothermal resources are located outside California. This reflects both the limited degree of exploration and development in States other than California and Nevada and the uniqueness of the vapor-dominated geothermal reservoir at The Geysers in northern California, which contributes approximately 1,000 MWe to the identified geothermal resource for the State but is unlikely to be matched by any equivalent occurrences on private or accessible public lands elsewhere in the United States. The undiscovered resources results indicate that additional exploration could add substantially to the total of identified geothermal resources and further expand geothermal power production. As indicated by the geothermal favorability map shown in figure 3, regions with significant geothermal potential but few identified geothermal systems include northeastern Nevada, western Utah, southern Idaho, eastern Oregon, and parts of New Mexico and Colorado.

Enhanced Geothermal Systems

Conventional geothermal resources depend on hydrothermal fluid circulation that arises only with the convergence of high temperatures—due either to magmatism or other tectonic processes that elevate temperature gradients in the Earth's crust—and permeability, typically fracture permeability produced as a result of active faulting (Duffield and Sass, 2003). Enhanced Geothermal Systems (EGS) are geothermal resources that require some form of engineering to develop the permeability necessary for the circulation of hot water or steam and the recovery of heat for electrical power generation. Because exploitation of EGS resources incorporates the augmentation or creation of permeability in place, the presence of elevated temperatures at drillable depths is the dominant factor controlling the quality of the resource.

Under the assumption of continued successful implementation of EGS technology, models for the extension of geothermal energy recovery techniques into regions of hot but low permeability crust yield an estimated mean electric power resource on private and accessible public land of 517,800 MWe (table 1), with a 95% probability of 345,100 MWe and a 5% probability of 727,900 MWe. This is approximately half of the current installed electric power generating capacity in the United States and an order of magnitude larger than the conventional geothermal resource. This estimate does not include Alaska and Hawaii, because there is not enough information to accurately estimate crustal temperatures in those States on a regional basis. With EGS technology at an early stage of development (DOE, 2008), the assessment results should be considered provisional.

The high crustal heat flow favorable for EGS development is more uniformly distributed across the western United States, and this is reflected in the distribution of the resource among the states, as shown in figure 2*C*. The EGS resource distribution, although large in total magnitude, is also relatively diffuse. In contrast to power production from conventional geothermal reservoirs, which is often concentrated at 10 to 20 MWe per km^2 of field area, the EGS resource outside of the high-temperature margins of

Table 1. Electric power generation potential in Megawatts-electric (MWe) from identified and undiscovered geothermal resources and Enhanced Geothermal Systems in the western United States.

[All electric power generation figures are calculated on a basis of 30 years of production. F95 represents a 95% chance of at least the amount tabulated; other fractiles are defined similarly. Fractiles are additive under the assumption of perfect positive correlation. N is the number of identified geothermal systems included in the estimate].

		Identified Resources (MWe)				Undiscovered Resources (MWe)				Enhanced Geothermal Systems (MWe)			
State	N	F95	F50	Mean	F5	F95	F50	Mean	F5	F95	F50	Mean	F5
Alaska	53	236	606	677	1,359	537	1,428	1,788	4,256	NA	NA	NA	NA
Arizona	2	4	20	26	70	238	775	1,043	2,751	33,000	52,900	54,700	82,200
California	45	2,422	5,140	5,404	9,282	3,256	9,532	11,340	25,439	32,300	47,100	48,100	67,600
Colorado	4	8	11	30	67	252	821	1,105	2,913	34,100	51,300	52,600	75,300
Hawaii	1	84	169	181	320	822	2,027	2,435	5,438	NA	NA	NA	NA
Idaho	36	81	283	333	760	427	1,391	1,872	4,937	47,500	66,700	67,900	92,300
Montana	7	15	51	59	130	176	573	771	2,033	9,000	16,100	16,900	27,500
Nevada	56	515	1,216	1,391	2,551	996	3,243	4,364	11,507	71,800	101,300	102,800	139,500
New Mexico	7	53	153	170	343	339	1,103	1,484	3,913	35,600	54,400	55,700	80,100
Oregon	29	163	485	540	1107	432	1,406	1,893	4,991	43,600	61,500	62,400	84,500
Utah	6	82	171	184	321	334	1,088	1,464	3,860	32,600	46,500	47,200	64,300
Washington	1	7	20	23	47	68	223	300	790	3,900	6,300	6,500	9,800
Wyoming	1	5	31	39	100	40	129	174	458	1,700	2,900	3,000	4,800
Total	248	3,675	8,356	9,057	16,457	7,917	23,739	30,033	73,286	345,100	507,000	517,800	727,900

identified geothermal systems averages approximately 0.5 MWe per km^2. However, continued advances in EGS technology, particularly with respect to creation of reservoirs at great depth and improved thermal energy recovery, could add substantially to the resource estimates (DOE, 2008).

EGS are not the only type of unconventional geothermal resource. Previous assessments (see for example, Muffler, 1979) indicated significant unconventional geothermal resource potential associated with fluids in deep sedimentary basins of the United States. These unconventional geothermal resources will be assessed in a future study.

Geothermal resources have the potential to play a much more significant role in our Nation's energy mix. This assessment of geothermal resources in the United States is only part of the USGS effort to help ensure our Nation's energy future.

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This Fact Sheet and any updates to it are available online at http://pubs.usgs.gov/fs/2008/3082/

Impact of SB243 on Geothermal Development in Alaska

Paul Thomsen
Director of Policy and Business Development
Ormat Technologies, Inc

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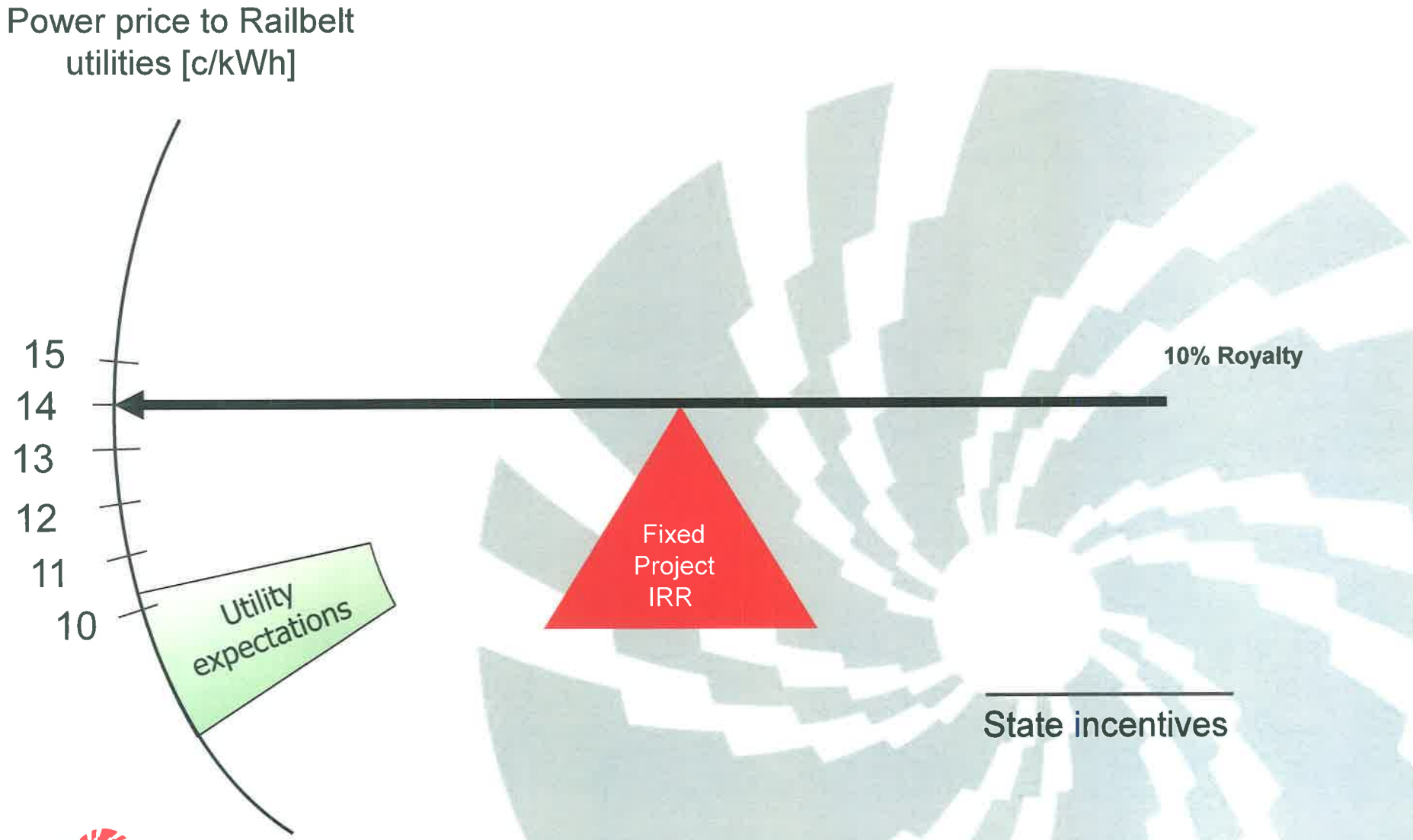
Estimated Power Price, Current Conditions



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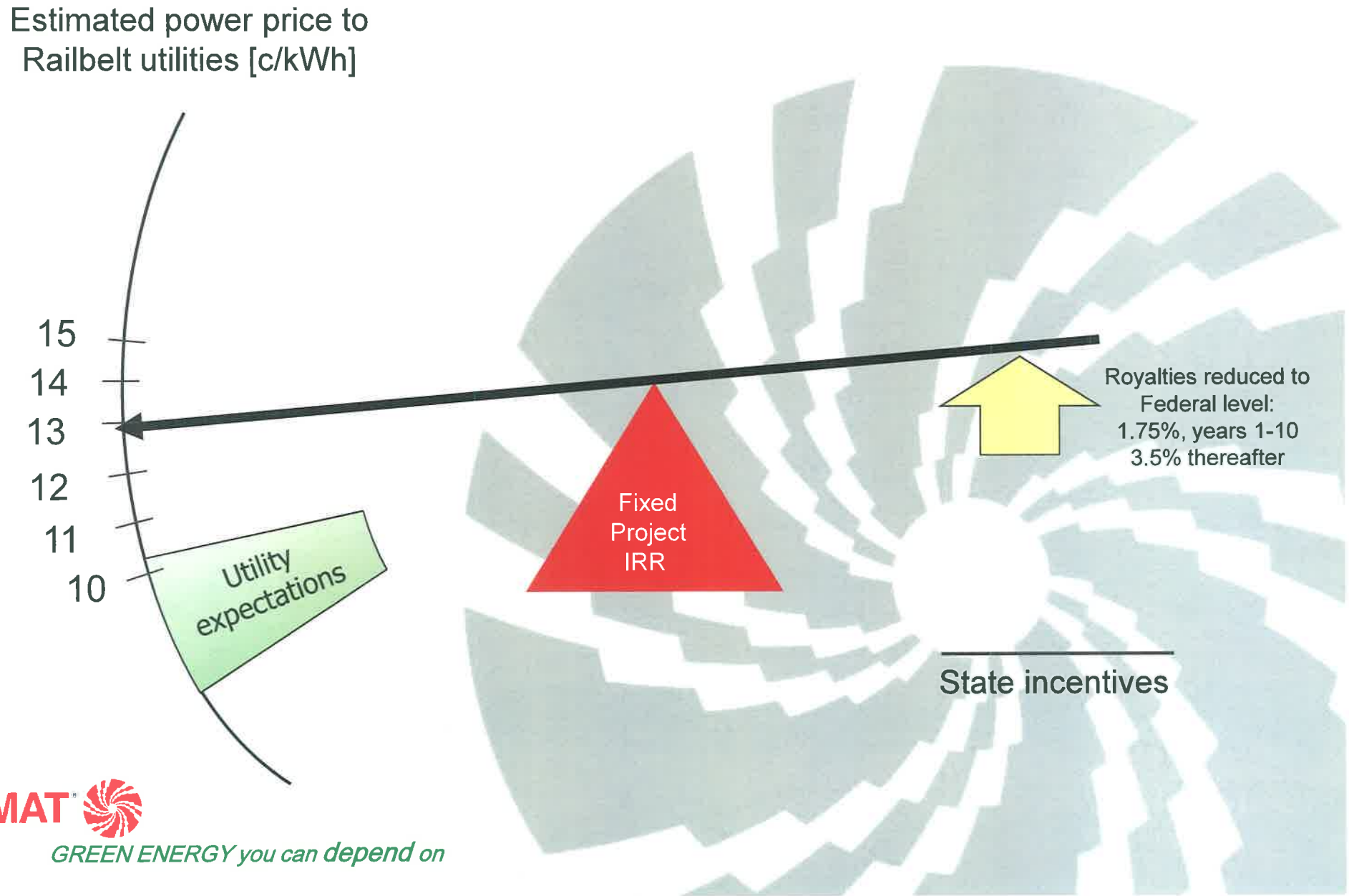
Impact of SB243 on Mt Spurr Power Price



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Economic Benefits to the State of Alaska

- Estimated royalty payment in 25 years[1]:

  50 * 0.95 * 8760 * 130 * 2.8% * 25 = **$38 million**

  MW | availability | hours /year | $/MWh | Average royalties | years

- Saving to railbelt ratepayers[1]:

  50 * 0.95 * 8760 * 10 * 25 = **$104 million**

  $/MWh reduction in power price

- Total economic benefit: **>$140 million**

[1] This is a simplified calculation, not accounting for inflation and other factors that will affect actual payment / saving

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Other Benefits to the State of Alaska

- Diversifies energy sources; Frees natural gas for heating
- Removes fuel cost risk
- Reduces emissions and fights climate change
- Creates green jobs

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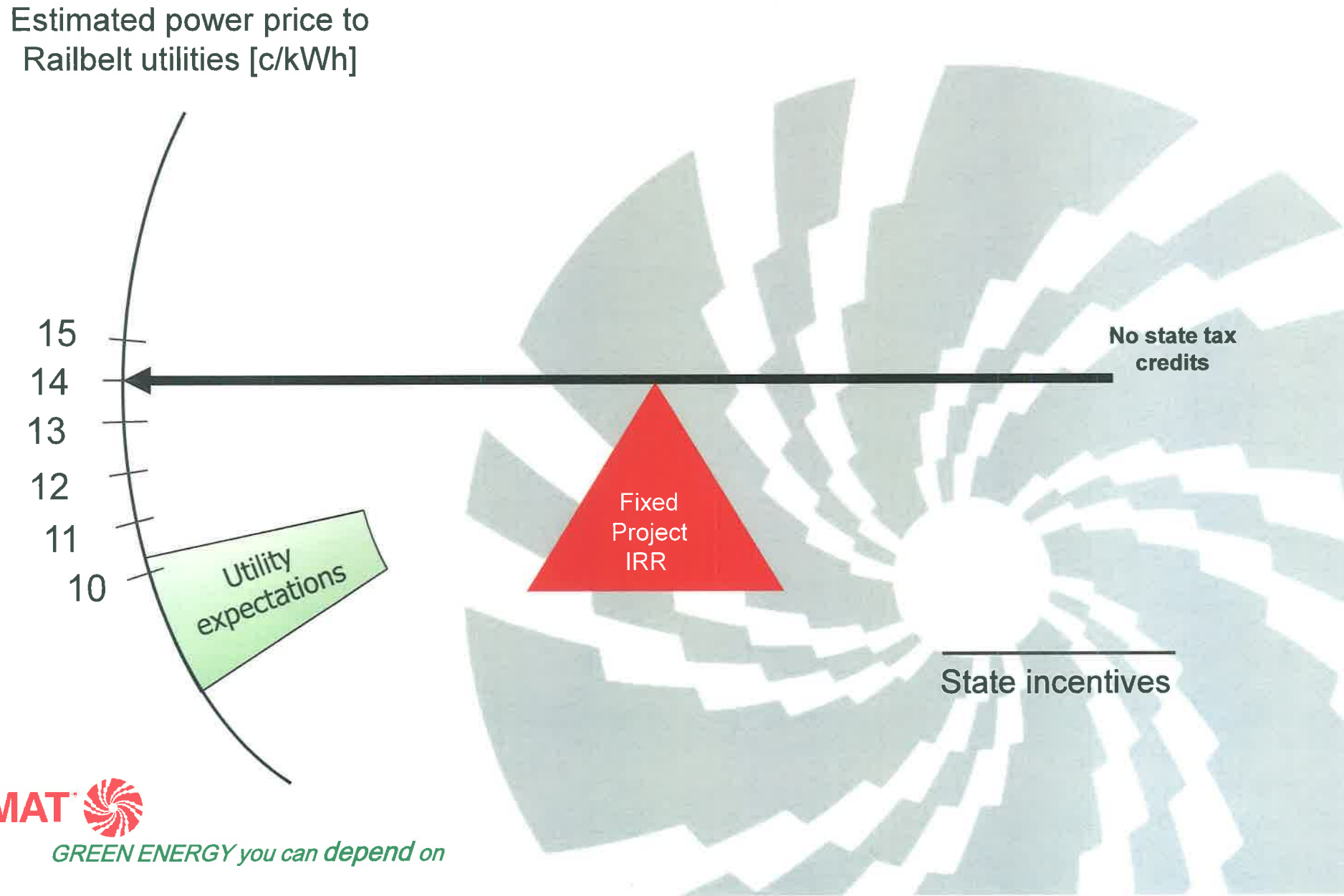

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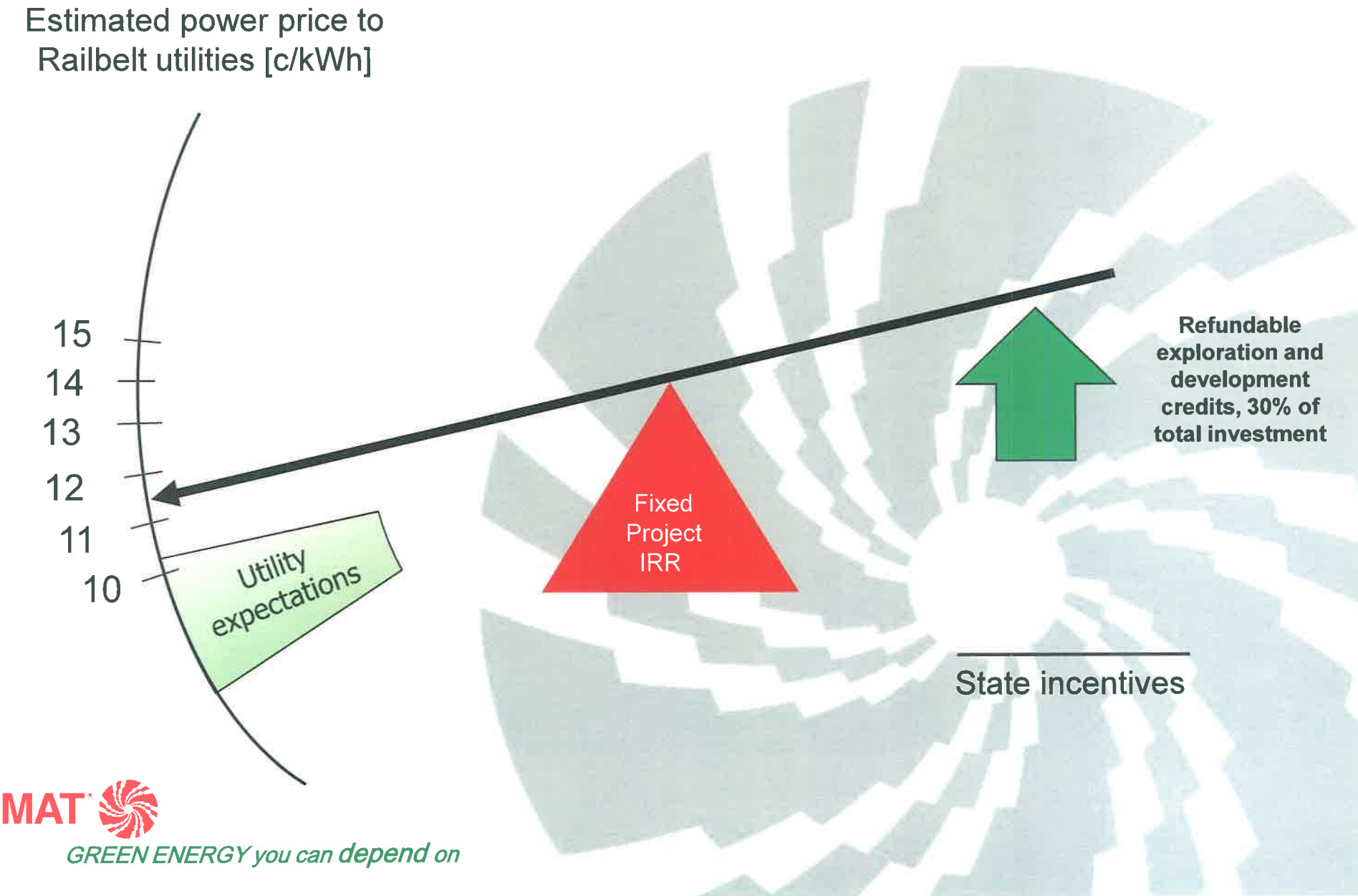
Impact of SB243 on Mt Spurr Power Price



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Cost and Economic Benefits to the State of AK

- Estimated cost of tax credits:

  30%* 275 = **($82.5 million)**

  Estimated cost of exploration and development [$m]

- Estimated saving to railbelt ratepayers[1]:

  50 * 0.95 * 8760 * 25 * 25 = **$260 million**

  MW | availability | hours /year | $/MWh saving | years

- Total economic benefit: **>$175 million**

[1] This is a simplified calculation, not accounting for inflation and other factors that will affect actual saving

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Other Benefits to the State of Alaska

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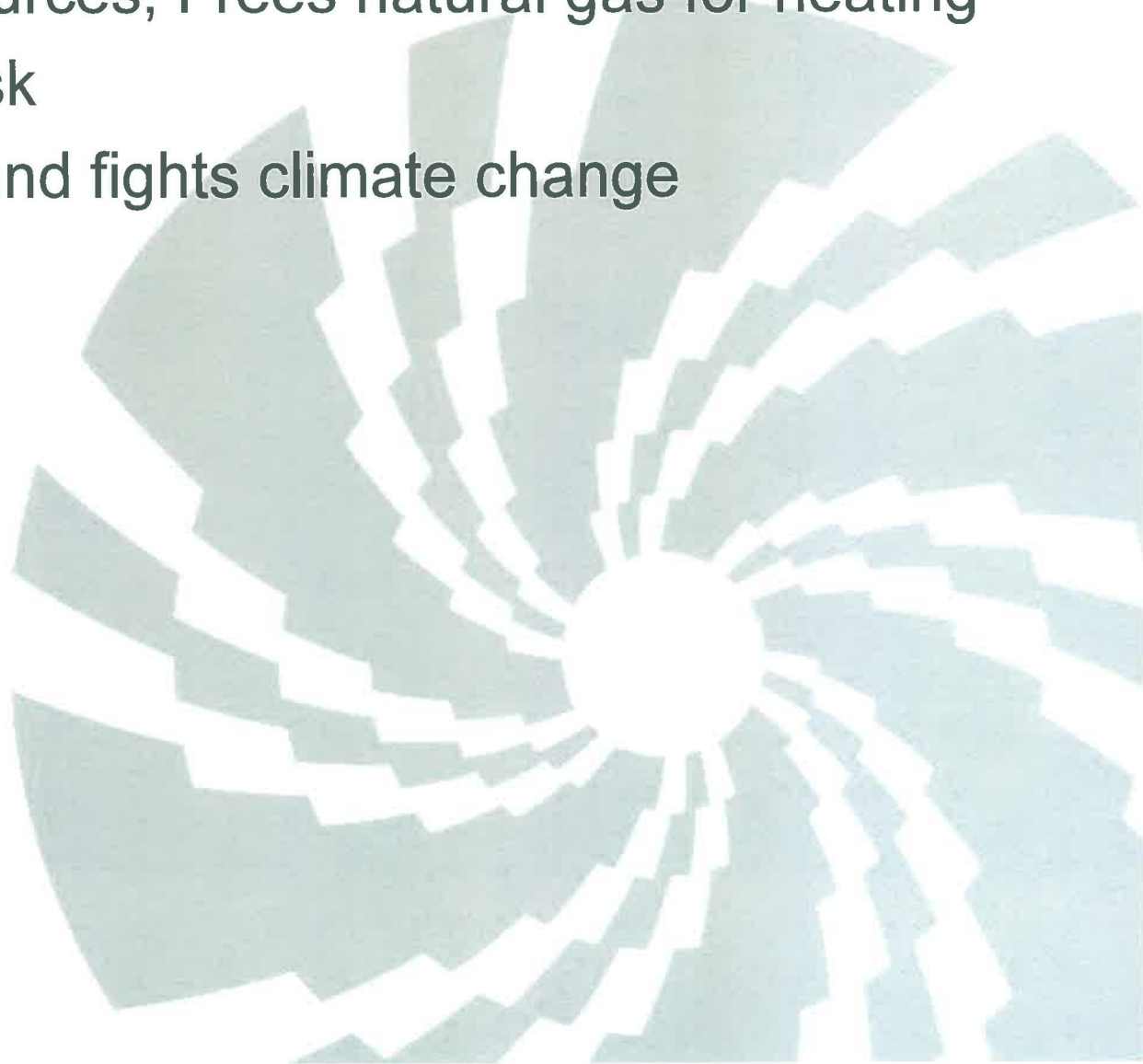

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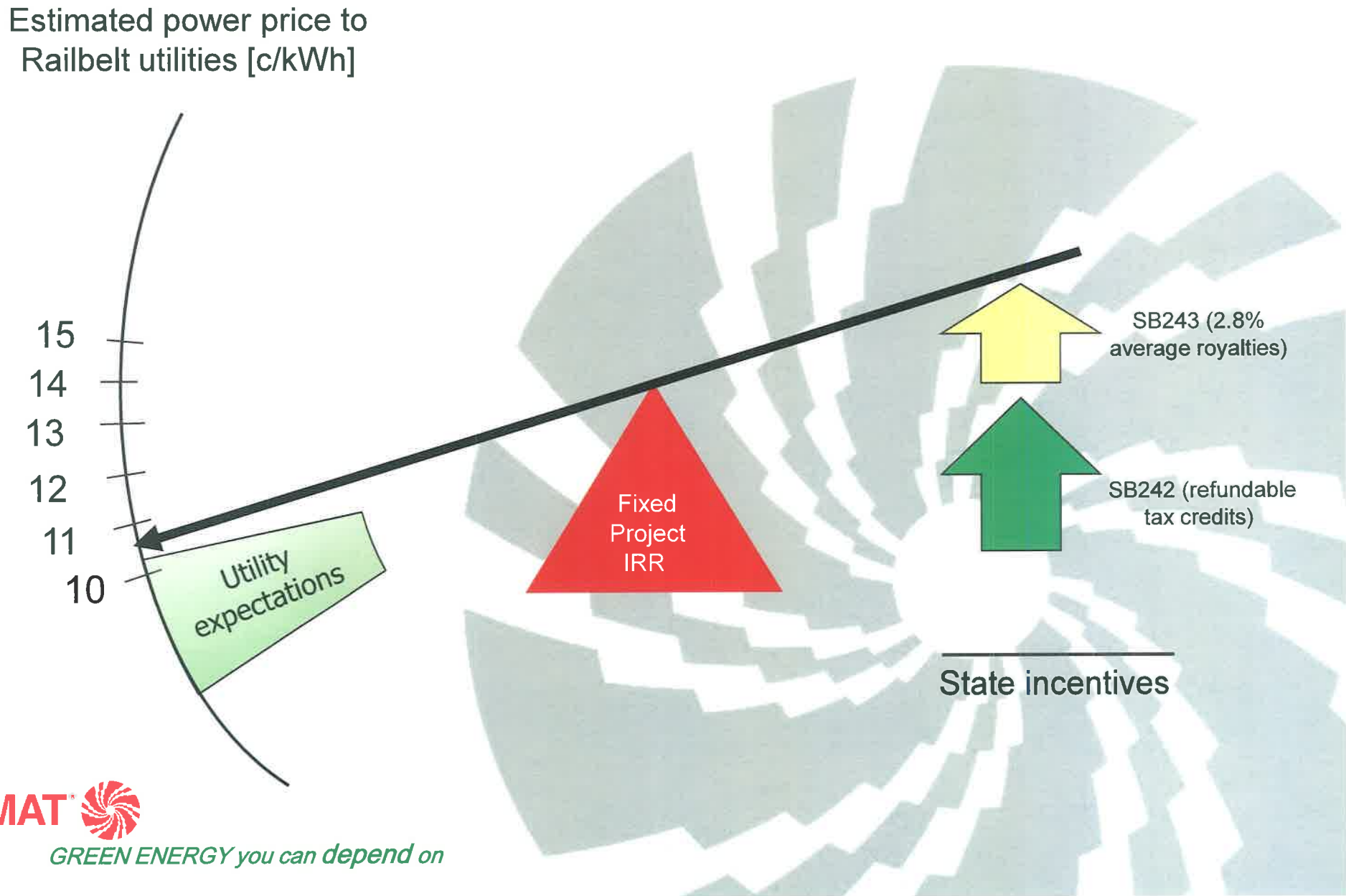
Impact of SB242 + SB243 on Power Price



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Impact of SB243 on Geothermal Development in Alaska

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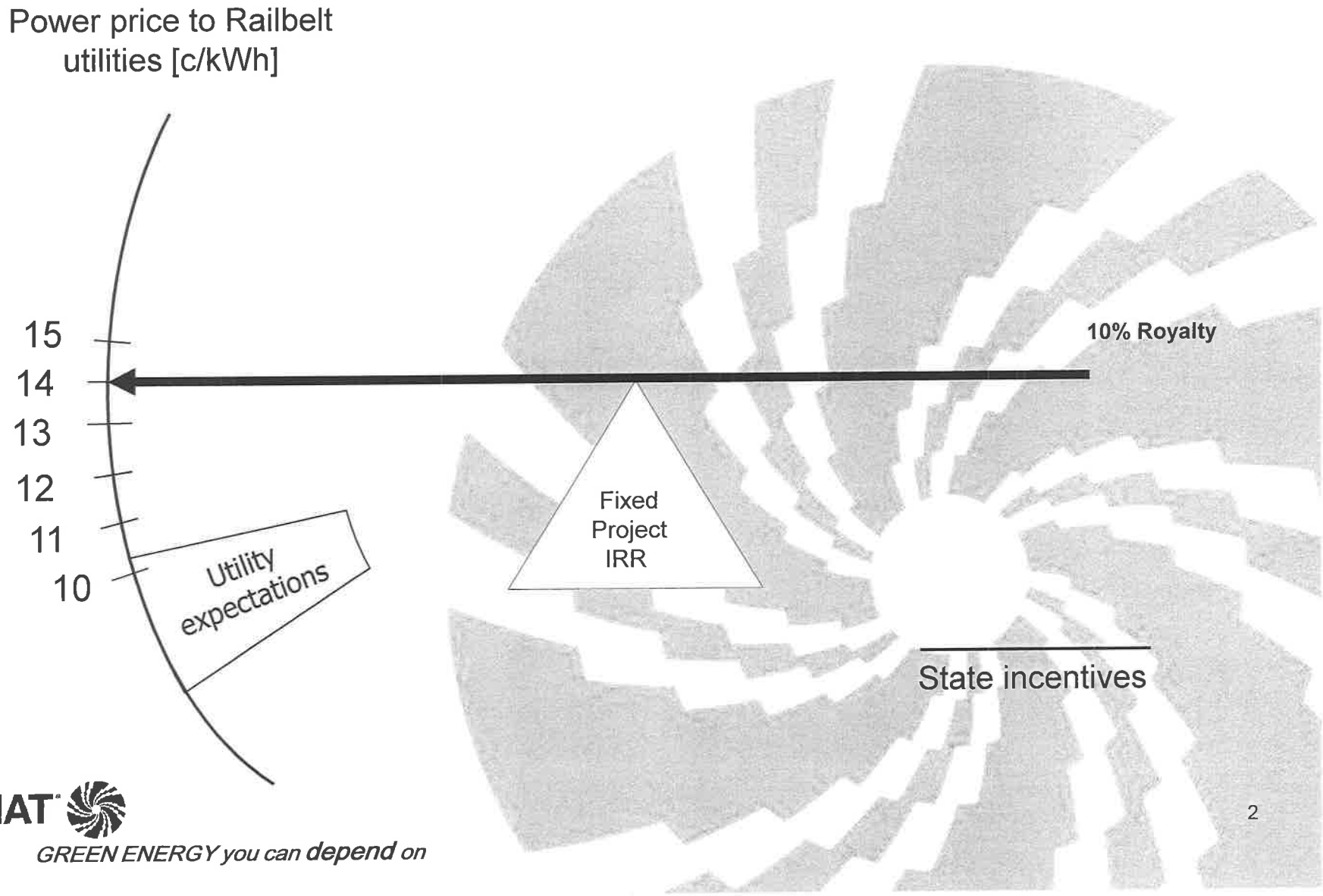
Estimated Power Price, Current Conditions



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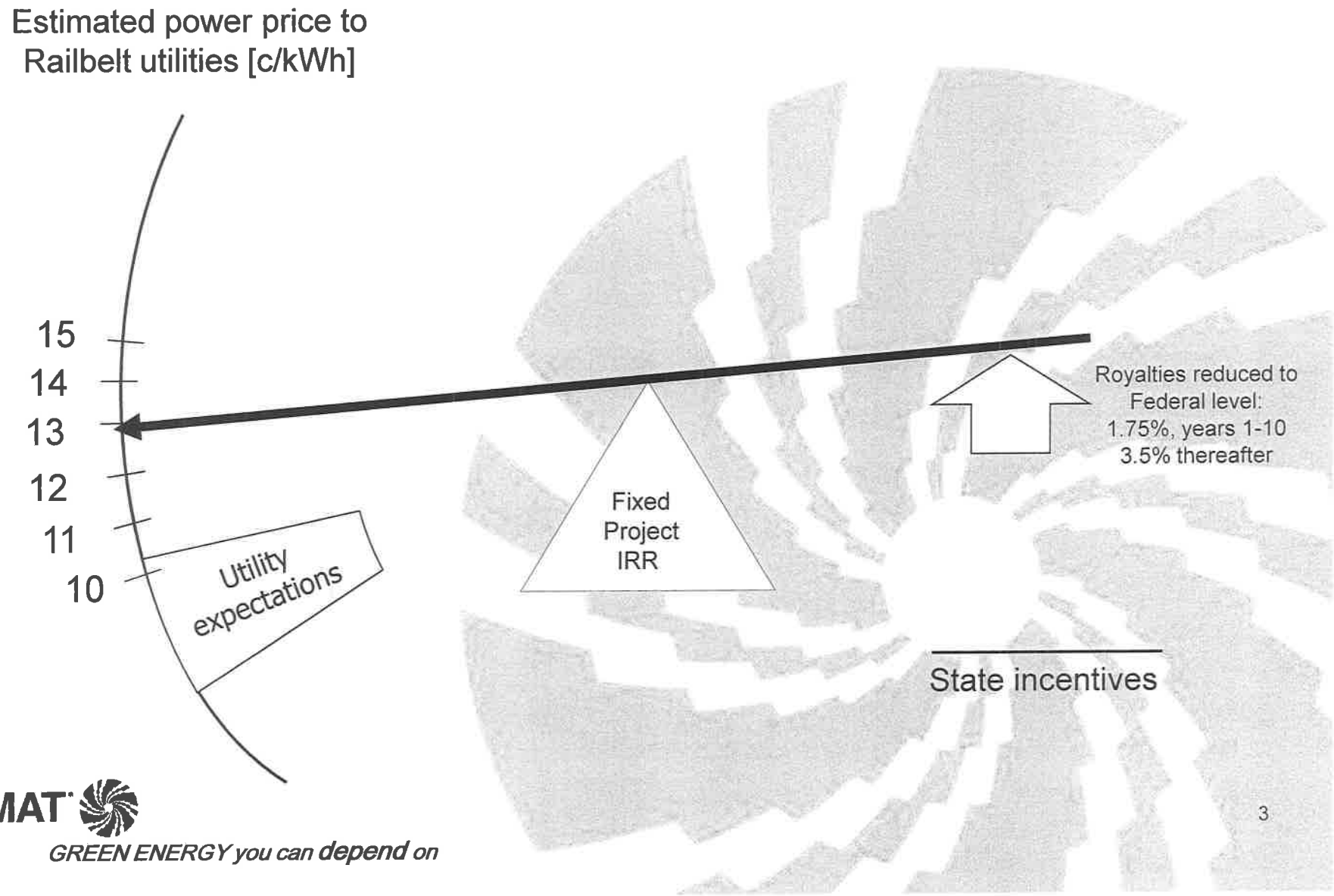
Impact of SB243 on Mt Spurr Power Price



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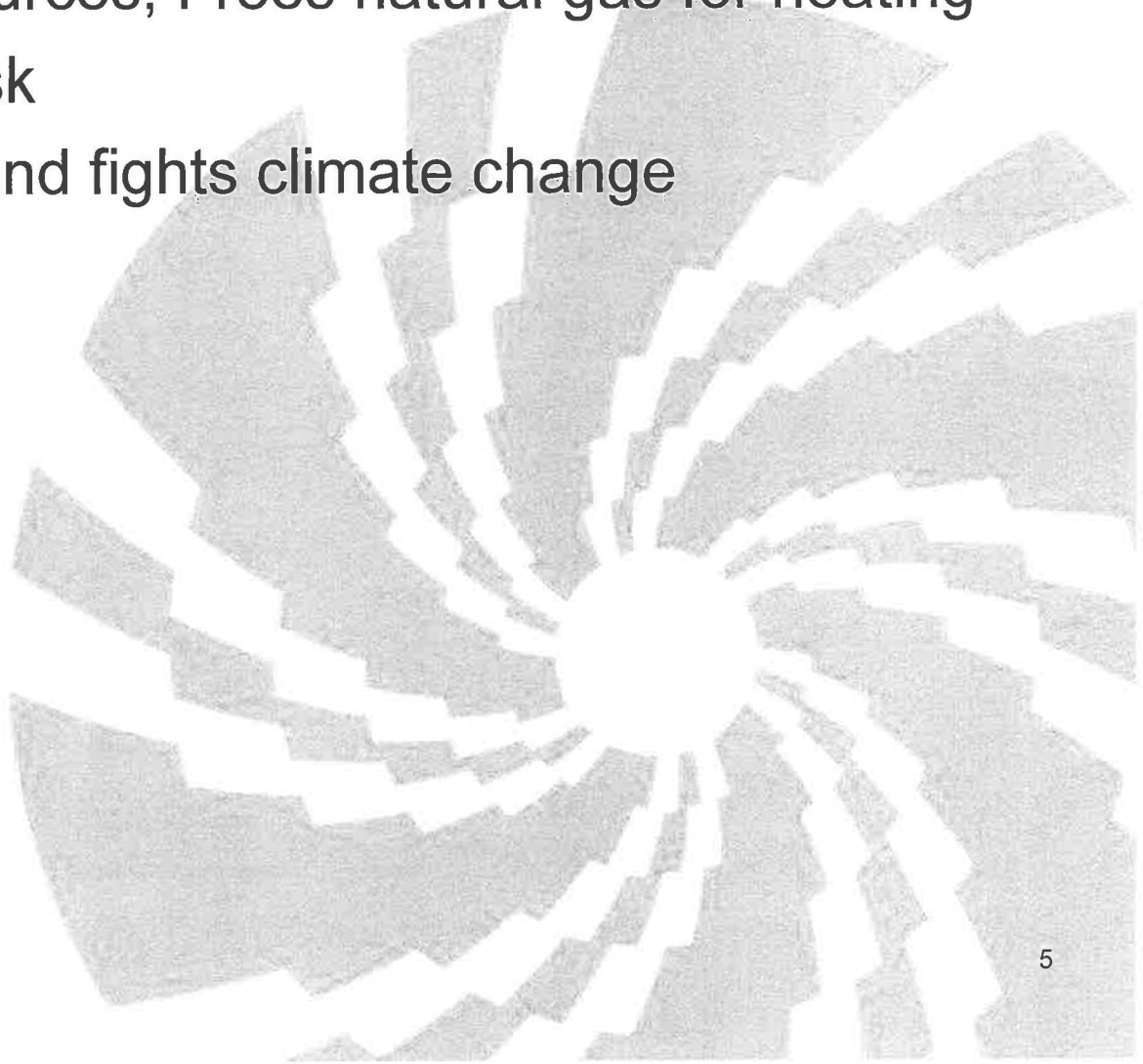

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