

Geothermal Energy Development in the Philippines

New Zealand
Geothermal Workshop
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NEW ZEALAND
TRADE & ENTERPRISE
Te Taurapa Tūhono

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Presentation Outline

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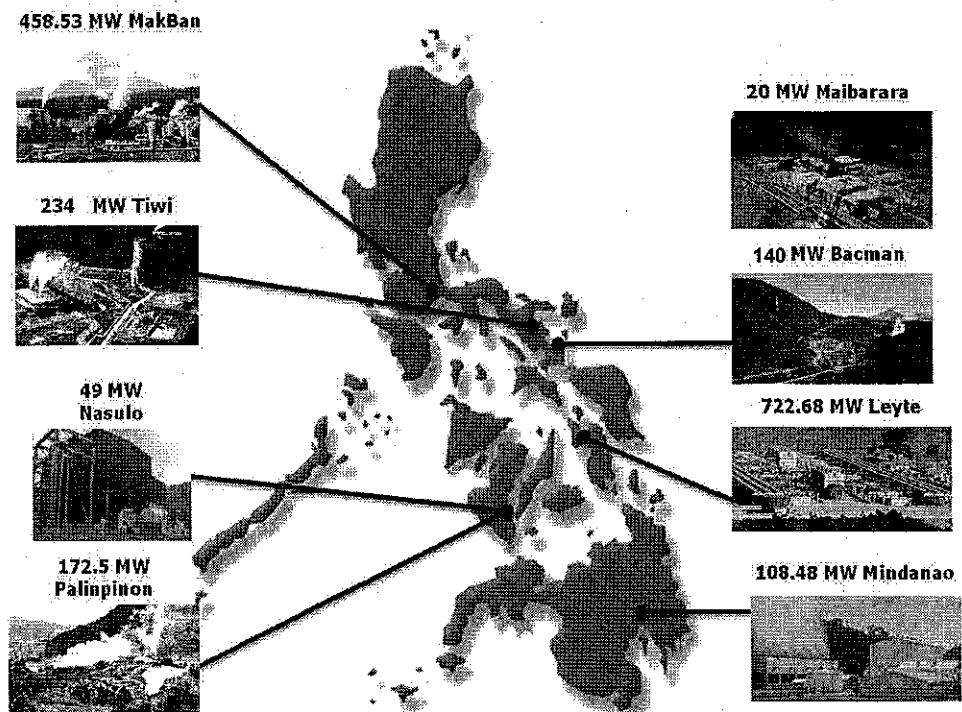
04

NZTE-led Geothermal Activities

Geothermal Energy Situation

Geothermal Power Plants

1,906 MW
Total Installed Capacity
(as of December 2016)



New RE Development

RE Capacity Addition Historical Development

RE Installations from 2009- Feb. 2017 under RA 9513

RESOURCES	2009		2010		2011		2012		2013		2014		2015		2016		Own Use		Total	
	No. of Projects	Installed Capacity MW	No. of Projects	Installed Capacity MW	No. of Projects	Installed Capacity MW	No. of Projects	Installed Capacity MW	No. of Projects	Installed Capacity MW	No. of Projects	Installed Capacity MW	No. of Projects	Installed Capacity MW	No. of Projects	Installed Capacity MW	No. of Projects	Installed Capacity MW	No. of Projects	Installed Capacity MW
Biomass	2	29.33	1	35.90	3	27.00	1	19.00	1	0.876	2	28.00	5	104.50	2	43.80	18	140.66	35	429.06
Geothermal	-	-	-	-	-	-	-	-	-	-	2	50.00	1	10.00	-	-	-	-	3	60.00
Solar	-	-	-	-	-	-	-	-	-	-	1	22.00	9	141.77	29	736.41	6	3.22	45	903.39
Hydro Power	-	-	2	2.00	1	2.10	2	11.80	-	-	4	16.65	2	14.82	2	2.00	-	-	13	49.37
Ocean Energy	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Wind	-	-	-	-	-	-	-	-	-	-	4	303.90	2	90.00	-	-	-	-	6	393.90
TOTAL	2	29.33	3	37.90	4	29.10	3	30.80	1	0.88	13	420.55	19	361.09	33	782.21	24	143.88	102	1,835.72

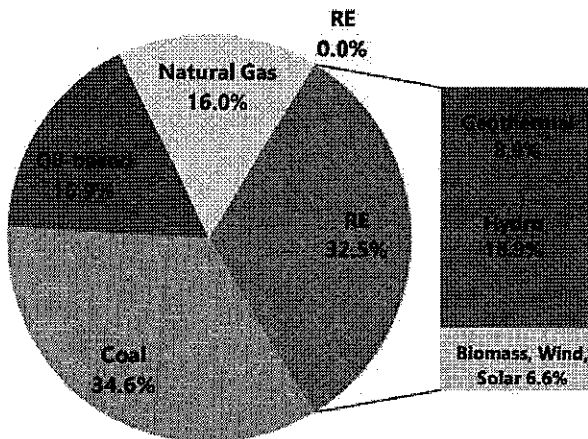
Capacity Addition since the enactment of RE Law = **1,835.89 MW**
 Installed Capacity under Net-Metering (recorded) = **5.324 MW**

TOTAL = 1,841.214 MW



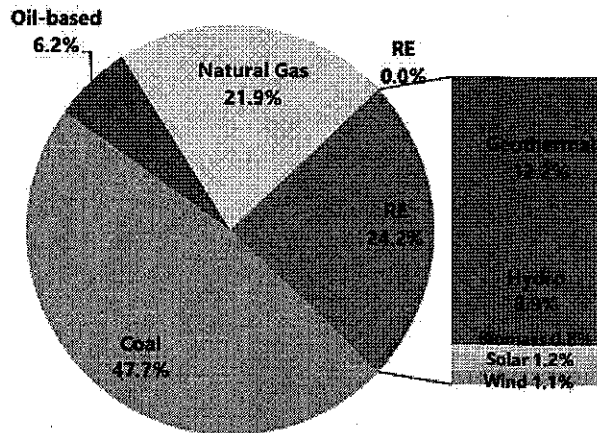
2016 Power Capacity and Gross Generation

Installed Capacity



Total Installed Capacity: 21,424 MW
Renewable Energy Share: 32.5%

Gross Generation



Total Generation: 90,797 GWh
Renewable Energy: 24.2%
RE + Nat Gas: 46.1%

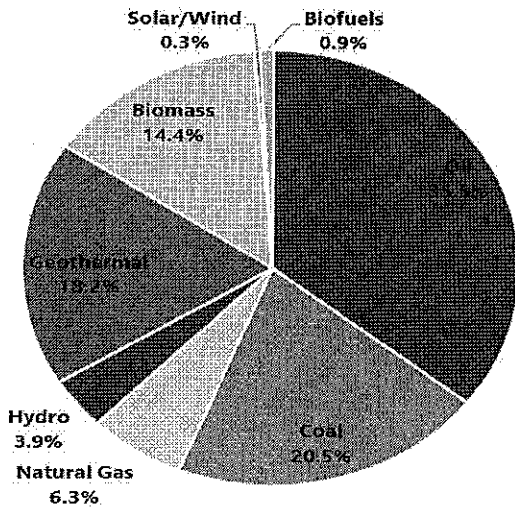


Strategic Directions for Geothermal

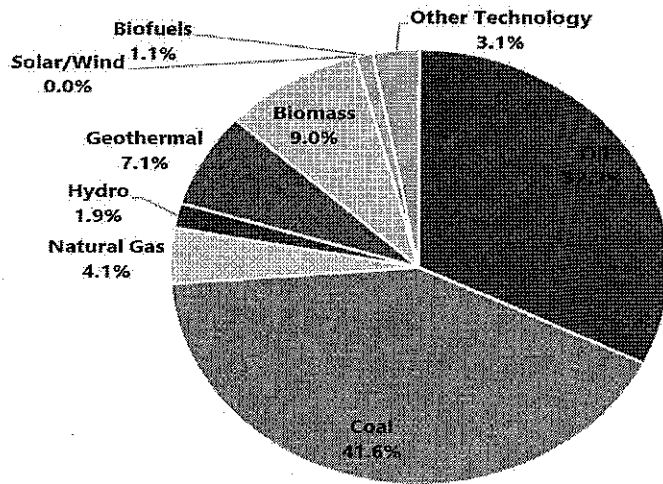
Strategic Directions 2017-2040

1 ENSURE ENERGY SECURITY	2 EXPAND ENERGY ACCESS	3 PROMOTE A LOW CARBON FUTURE	4 STRENGTHEN COLLABORATION AMONG ALL GOVERNMENT AGENCIES INVOLVED IN ENERGY
5 IMPLEMENT, MONITOR AND INTEGRATE SECTORAL AND TECHNOLOGICAL ROADMAPS AND ACTION PLANS	6 ADVOCATE THE PASSAGE OF THE DEPARTMENT'S LEGISLATIVE AGENDA	7 STRENGTHEN CONSUMER WELFARE AND PROTECTION	8 FOSTER STRONGER INTERNATIONAL RELATIONS AND PARTNERSHIPS

Primary Energy Mix 2016-2040



2016 Actual (prelim)
Total Energy: 52.2 MTOE



2040 Outlook
Total Energy: 134.2 MTOE



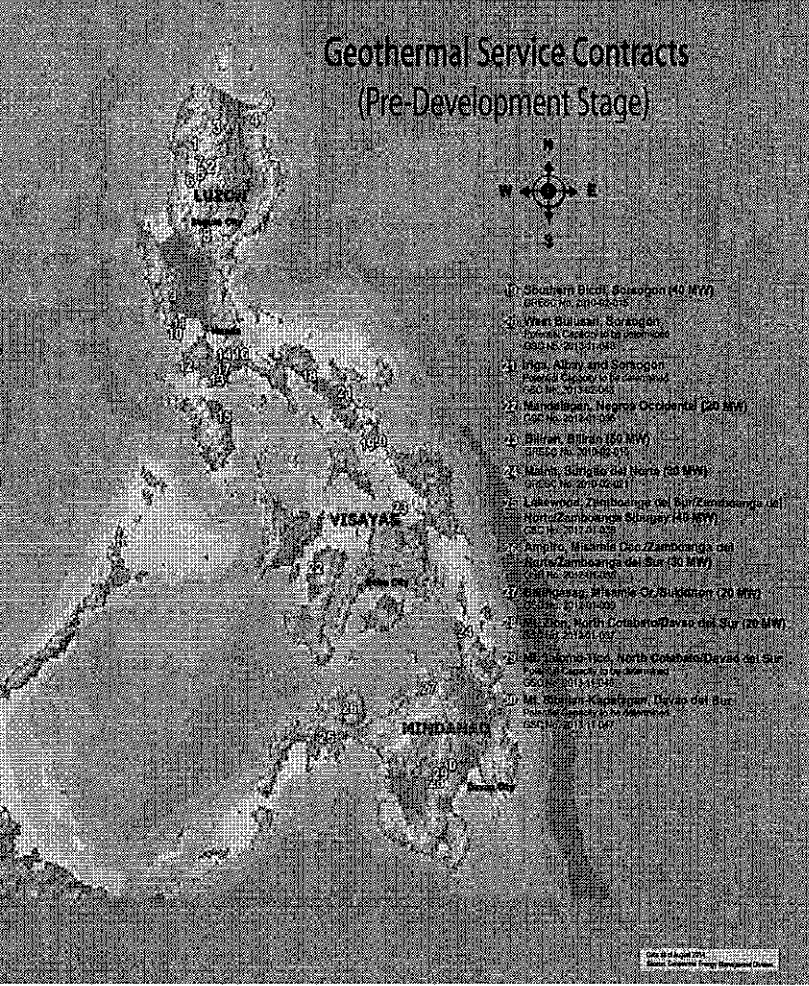
Investment Landscape – Opportunities and Challenges





Geothermal Service Contracts (Pre-Development Stage)

- 1. 241-Lapad-Bohayan-Subito-Tubo, Alon Power Company to be determined
OSCE No. 2011-12-03
- 2. Mainit-Sadanga, MI Province (50 MW)
OSCE No. 2010-03-23
- 3. Kalinga, Kalinga Province (50 MW)
OSCE No. 2010-03-24
- 4. Capas-Kaula-Cagayan (40 MW)
OSCE No. 2011-12-03
- 5. Budjales-Thrac, Benguet/Itogon (20 MW)
OSCE No. 2011-12-03
- 6. Cervantes-Hooda-Sulita, Province/Benguet Power Company to be determined
OSCE No. 2011-12-03
- 7. East-Makyanon-Rupit-Berangas-Mt. Province Power Company to be determined
OSCE No. 2011-12-03
- 8. Dablan, Benguet/Itogon (20 MW)
OSCE No. 2011-12-03
- 9. Negros-Candayan-Cambagan-Panay Power Company to be determined
OSCE No. 2011-12-03
- 10. Marikina, Bohol
OSCE No. 2011-12-03
- 11. North, Batangas (40 MW)
OSCE No. 2011-04-01
- 12. San Ildefonso, Batangas (20 MW)
OSCE No. 2011-12-03
- 13. MAMN, Batangas (20 MW)
OSCE No. 14
- 14. Piling-Lupa, Laguna (40 MW)
Power Company to be determined
OSCE No. 2011-12-03
- 15. Mantalaga, Central Mindoro (40 MW)
OSCE No. 2011-12-03
- 16. Tayabas-Luchan-Fayable-Guzon Power Company to be determined
OSCE No. 2011-12-03
- 17. Tawog, Laguna/Quezon/Batangas Power Company to be determined
OSCE No. 2011-12-03
- 18. Lobo, Quezon/Camarines Norte and Sur (65 MW)
OSCE No. 2011-12-03



- 19. Southern Bicol, Sorsogon (40 MW)
OSCE No. 2011-03-23
- 20. West Bulacan, Sorsogon Power Company to be determined
OSCE No. 2011-03-23
- 21. Uyan, Agao and Sorsogon Power Company to be determined
OSCE No. 2011-03-23
- 22. Mandalagan, Negros Occidental (20 MW)
OSCE No. 2011-03-23
- 23. Biliran, Biliran (50 MW)
OSCE No. 2011-03-23
- 24. Mainit, Sargao del Norte (20 MW)
OSCE No. 2011-03-23
- 25. Lakeview, Zamboanga del Sur/Zamboanga del Norte/Zamboanga Sibuyan (40 MW)
OSCE No. 2011-03-23
- 26. Ampio, Misamis Occ./Zamboanga del Norte/Zamboanga del Sur (30 MW)
OSCE No. 2011-03-23
- 27. San Roque, Zamboanga del Sur (20 MW)
OSCE No. 2011-03-23
- 28. Mt. Apo, North Cotabato/Davao del Sur (20 MW)
OSCE No. 2011-03-23
- 29. Mt. Apo, North Cotabato/Davao del Sur (20 MW)
OSCE No. 2011-03-23
- 30. Mt. Apo, North Cotabato/Davao del Sur (20 MW)
OSCE No. 2011-03-23

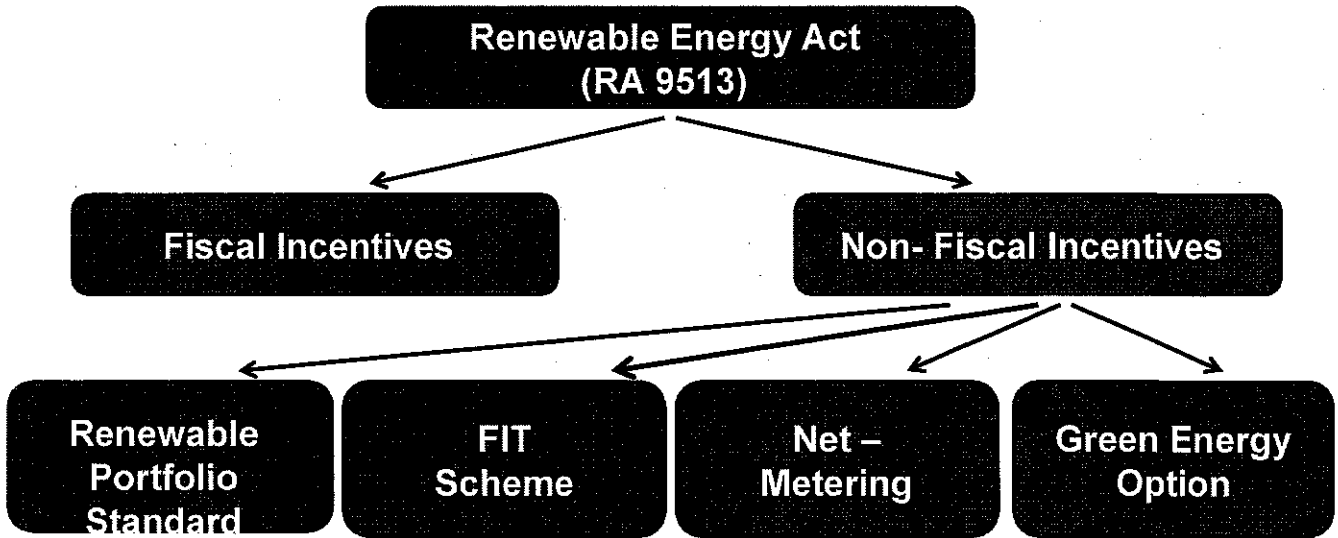
LEGEND

- 1. OSCE - Geothermal RE Service Contracts
- 2. OSCE - Geothermal Service Contracts
- 3. OSCE under P1344



Republic Act No. 9513: The Renewable Energy Law

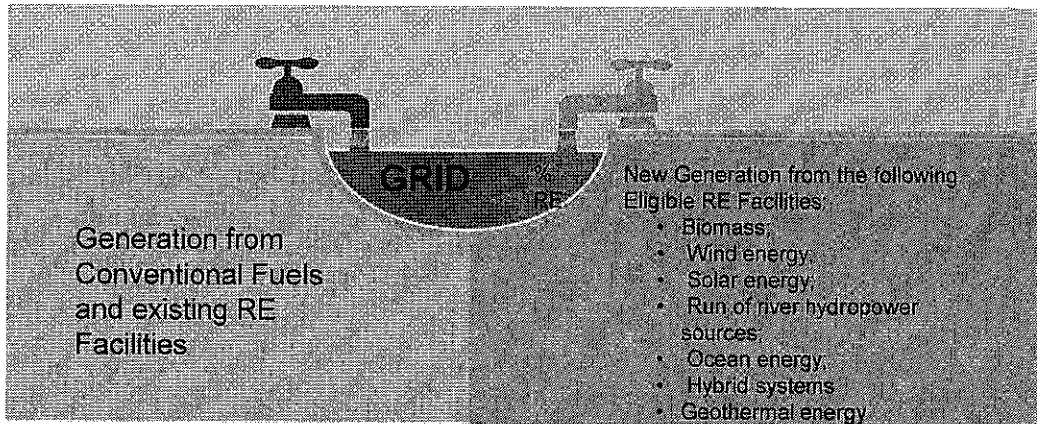
INCENTIVES UNDER RE ACT



Renewable Portfolio Standards

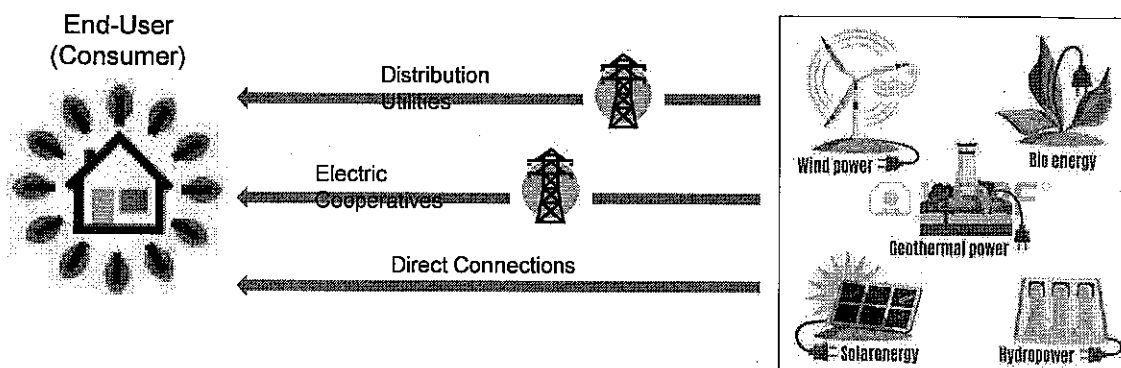
- ✓ Mandated Renewable Energy electricity blend to the total supply of electricity for on-grid and off-grid areas.

Will Create Market for Renewable Energy



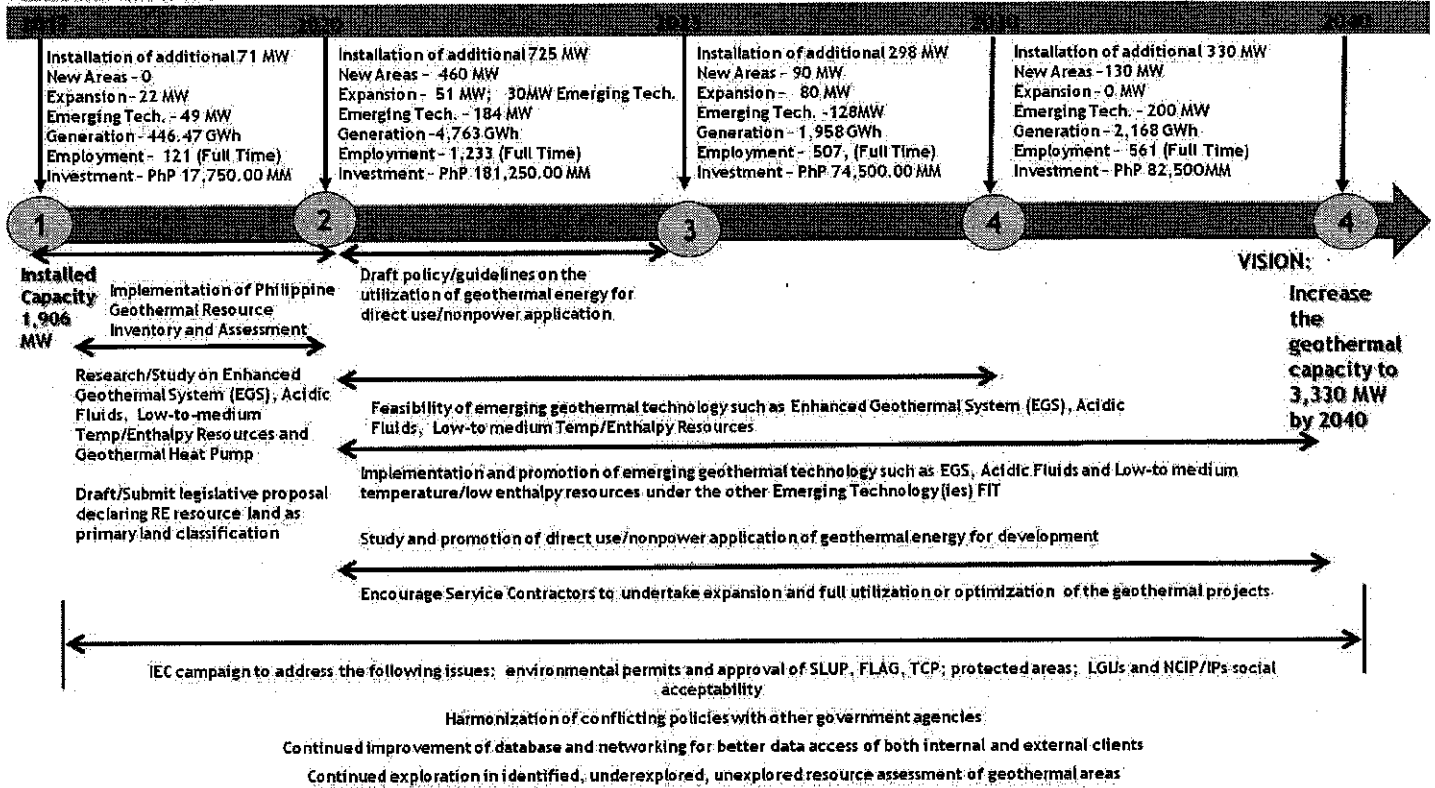
GREEN ENERGY OPTION

- ✓ A Renewable Energy Policy Mechanism which shall provide end-user the option to choose RE Resources as their source of Energy.



ROADMAP for the EXPLORATION, DEVELOPMENT and UTILIZATION of

Establishment of RPS **GEOTHERMAL RESOURCES IN THE PHILIPPINES (2017-2040)**

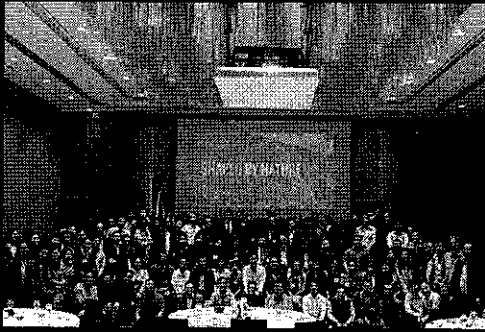


Opportunities for Business Partnerships

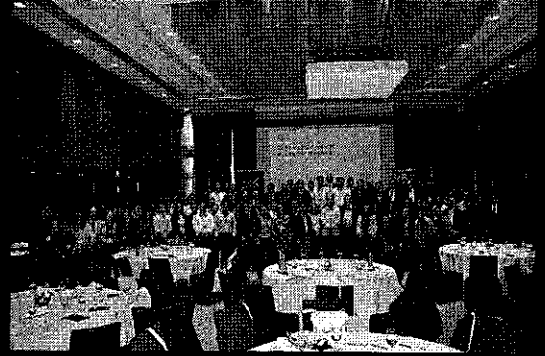
- Resource assessment; detailed engineering design
- FS preparation; FS Review/Validation
- Project Management; Owner's/Lender's Engineer
- Technology Supply; O&M
- Investment



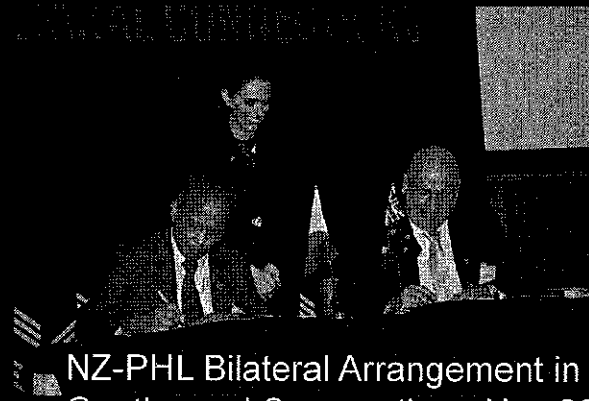
NZTE Geothermal Engagements



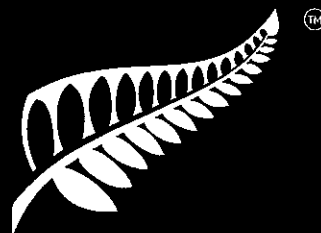
NGAP Day 2016



NGAP Day 2017

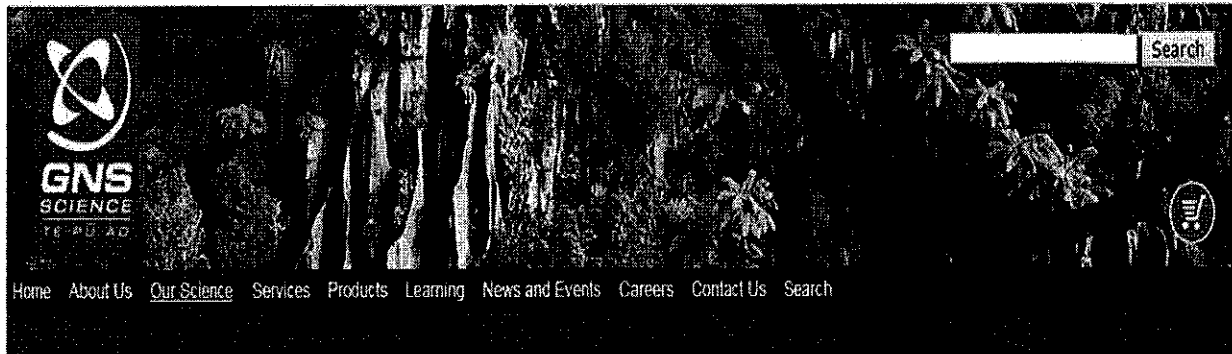


NZ-PHL Bilateral Arrangement in
Geothermal Cooperation - Nov 2017



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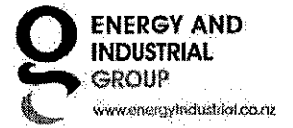
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