

Manado, North Sulawesi



SI TOU TIMOU TUMOU TOU

A Man Exists to Enliven Others

Universitas Sam Ratulangi

Manado



Ellen Ioan Kumaat
Rector

The Role of Sam Ratulangi University in

Planning and Utilizing of Renewable Energy in North Sulawesi



Ministry of Research, Technology and Higher Education
Republic of Indonesia
University of Sam Ratulangi
Manado, North Sulawesi



I N D O N E S I A

SULAWESI

Bandar Seri Begawan

Kuala Lumpur

Singapore

Singapore

Celebes Sea

Molucca Sea

Malacca Strait

Java Sea

Java Sea

Hutchinson Sea

Jakarta

Flores Sea

Sulawesi Sea

Sava Sea

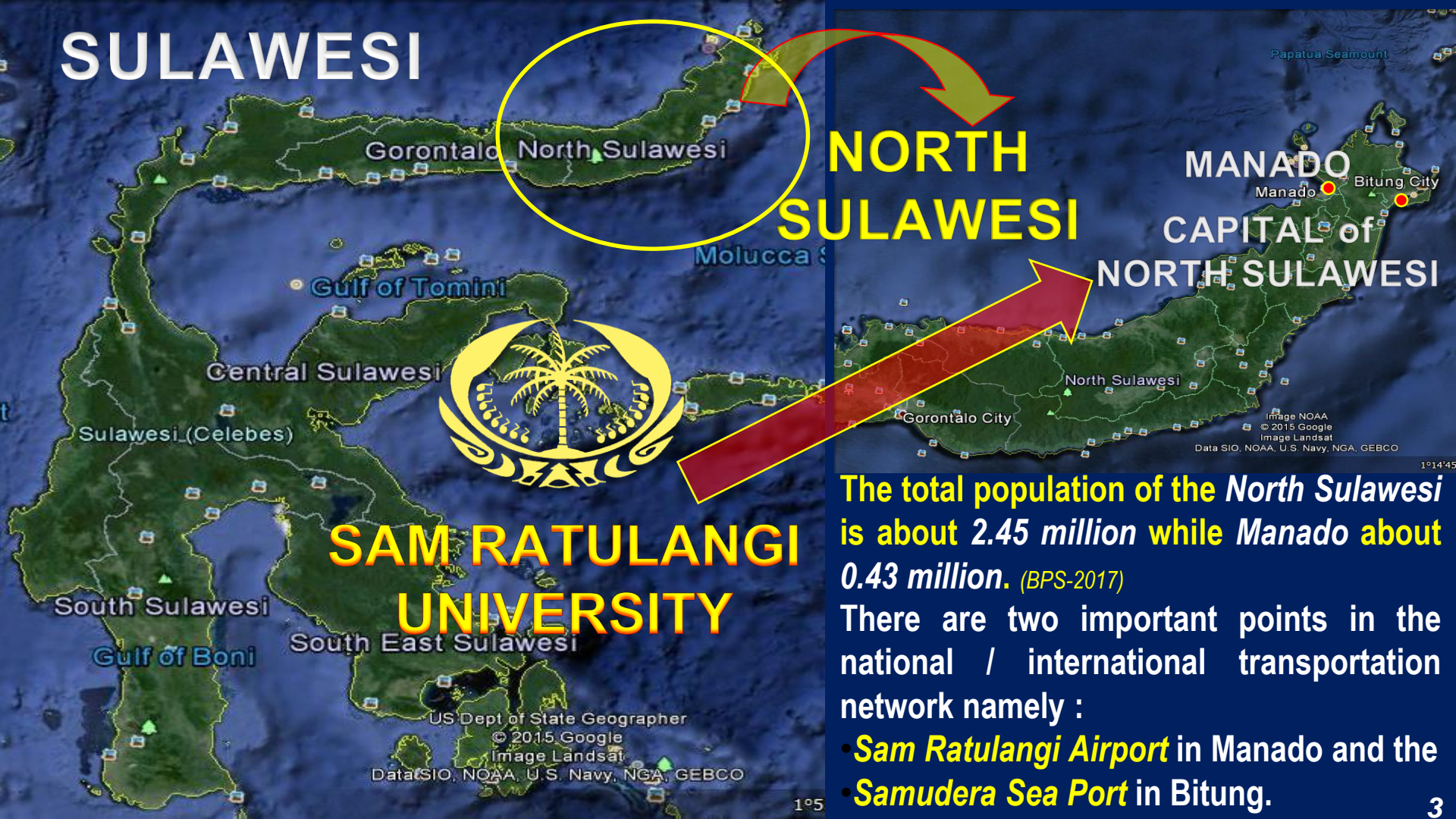
Timor-Leste

Christmas Island Flying Fish Cove

US Dept of State Geographer

Thailand Gulf of Thailand

SULAWESI



NORTH SULAWESI

MANADO
Manado
Bitung City
**CAPITAL of
NORTH SULAWESI**

SAM RATULANGI UNIVERSITY

The total population of the **North Sulawesi** is about **2.45 million** while **Manado** about **0.43 million**. (BPS-2017)

There are two important points in the national / international transportation network namely :

- **Sam Ratulangi Airport** in Manado and the
- **Samudera Sea Port** in Bitung.

Vision of Sam Ratulangi University

to be an **EXCELLENT UNIVERSITY** and **CULTURED**

A leading university in the eastern part of Indonesia for developing human resources and focusing on the studies necessary to explore the economic potentials of the pacific region

- *Natural resources*
 - *Human and public resources*
 - *Cultural resources*
- 

Mission of Sam Ratulangi University

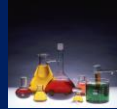
Based on :

Vision of
Sam Ratulangi University

Tridharma of
Higher Educational Institution



to develop
education/teaching



research



entrepreneurship



to produce

a community with high academic and cultural quality





FACULTY and OTHER INSTITUTION

1. Faculty of Medicine
 2. Faculty of Engineering
 3. Faculty of Agriculture
 4. Faculty of Animal Science
 5. Faculty of Fisheries and Marine Science
 6. Faculty of Economics and Business
 7. Faculty of Law
 8. Faculty of Political and Social Sciences
 9. Faculty of Humanities
 10. Faculty of Mathematics and Natural Sciences
 11. Faculty of Public Health
 12. Post Graduate Program
 13. Quality Assurance Institution
 14. Research and Public Service Institution
 15. Education Development and Teaching Improvement Institution
- Information and Communication Technology
 - International Services
 - Printing and Publication





STUDENT BODY

Faculty of Medicine	2982
Faculty of Engineering	3504
Faculty of Agriculture	2120
Faculty of Animal Sciences	778
Faculty of Fisheries and Marine Sciences	1140
Faculty of Economics and Business	5398
Faculty of Law	3209
Faculty of Social and Political Sciences	3676
Faculty of Humanities	1109
Faculty of Mathematics and Natural Sciences	1416
Faculty of Public Health	1540
Postgraduate Program (master, doctorate, profession, medical specialist)	714
TOTAL	27586

Teaching Staff

Faculty of Medicine : 190 persons

Faculty of Engineering : 196 persons

Faculty of Agriculture : 185 persons

Faculty of Animal Science : 137 persons

Faculty of Fisheries and Marine Science : 169 persons

Faculty of Mathematics and Natural Sciences : 86 persons

Faculty of Economics and Business : 156 persons

Faculty of Law : 191 persons

Faculty of Political and Social Sciences : 148 persons

Faculty of Humanities : 71 persons

Faculty of Public Health : 41 persons

Total : 1570 persons → **Professor : 99 persons**



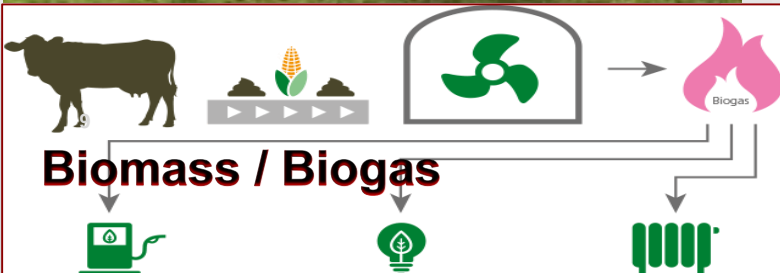
Wind



Geothermal



Solar



Biomass / Biogas

Potential Energy Resources in North Sulawesi

TOTAL: **5386 MW** + unplanned

No	Energy	Unit	Capacity
1	Wind Energy	MW	1214
2	Biogas	MW	13,8
3	Biomass	MW	150,2
4	Solar	MW	2113
5	Hydro	MW	888,6
6	Geothermal	MW	128
	Geothermal (Reserve)	MW	768
7	Minihydro/Microhydro	MW	111
8	Marine Energy	MW	Unplanned

Source: National Energy Planning, 2017

North Sulawesi's Rivers



Bolaang Mongondow

21 rivers

176 m³/s

Minahasa

23 rivers

86 m³/s

Sangihe Talaud

4 rivers

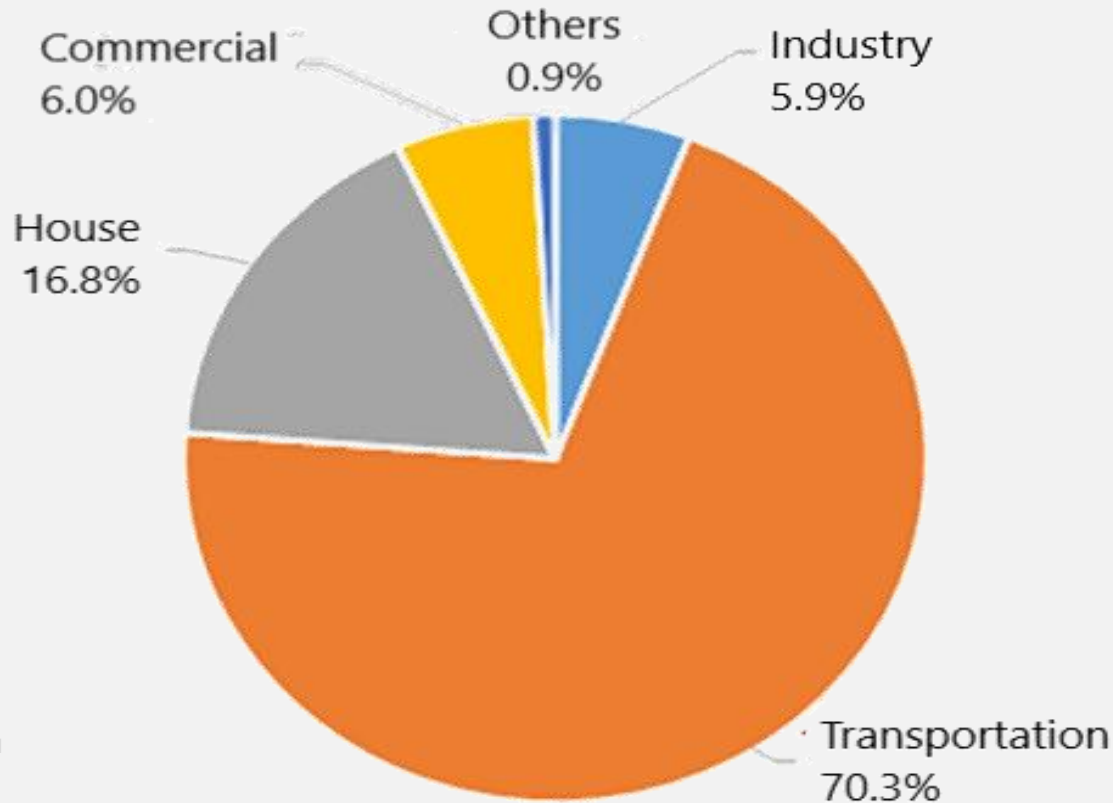
11 m³/s

TOTAL

48 rivers (273 m³/s)

Energy Utilization in North Sulawesi

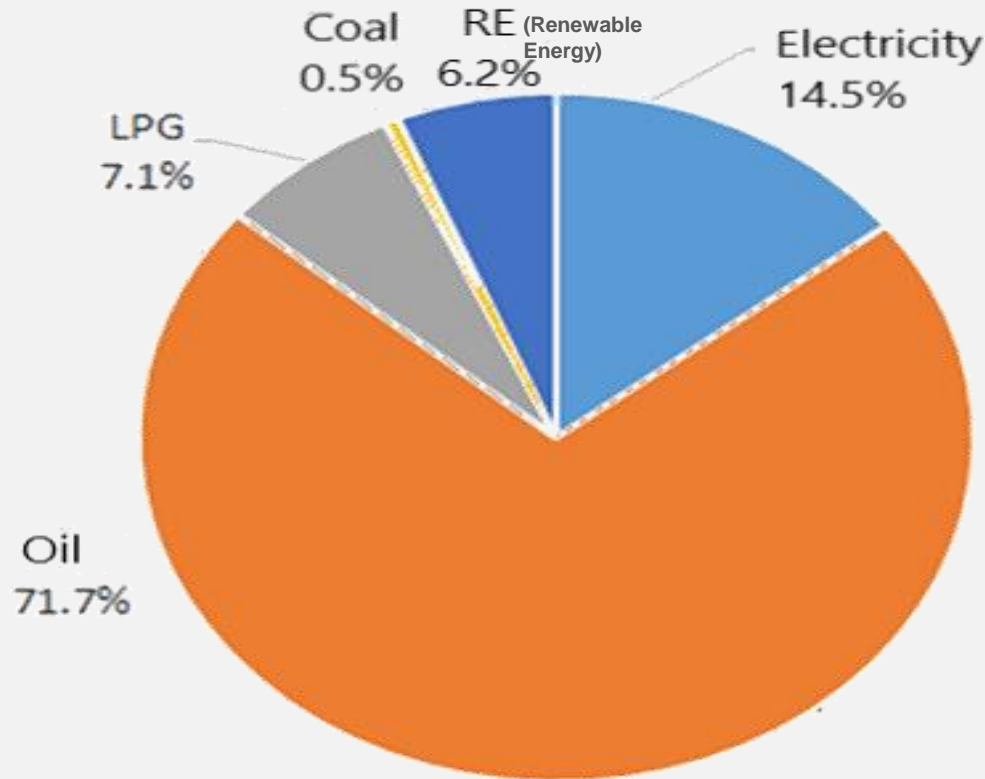
Total: 774,000.- TOE



11

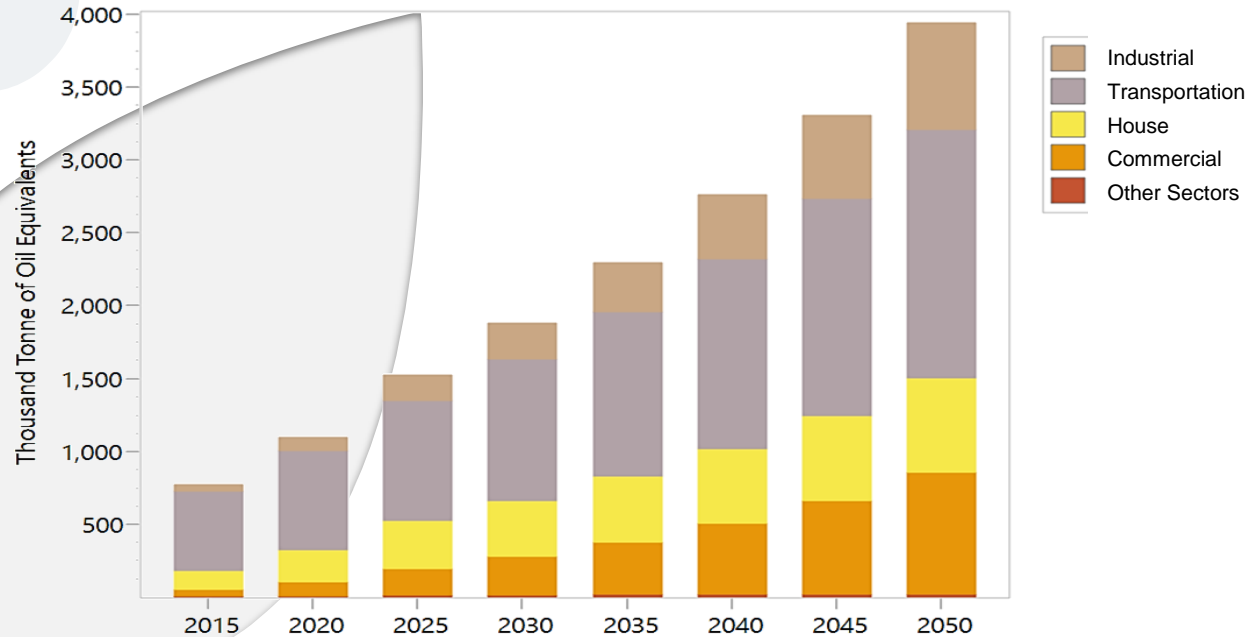
Energy Sources Condition in North Sulawesi

Total: 774,000.- TOE



Projection of Energy Needs

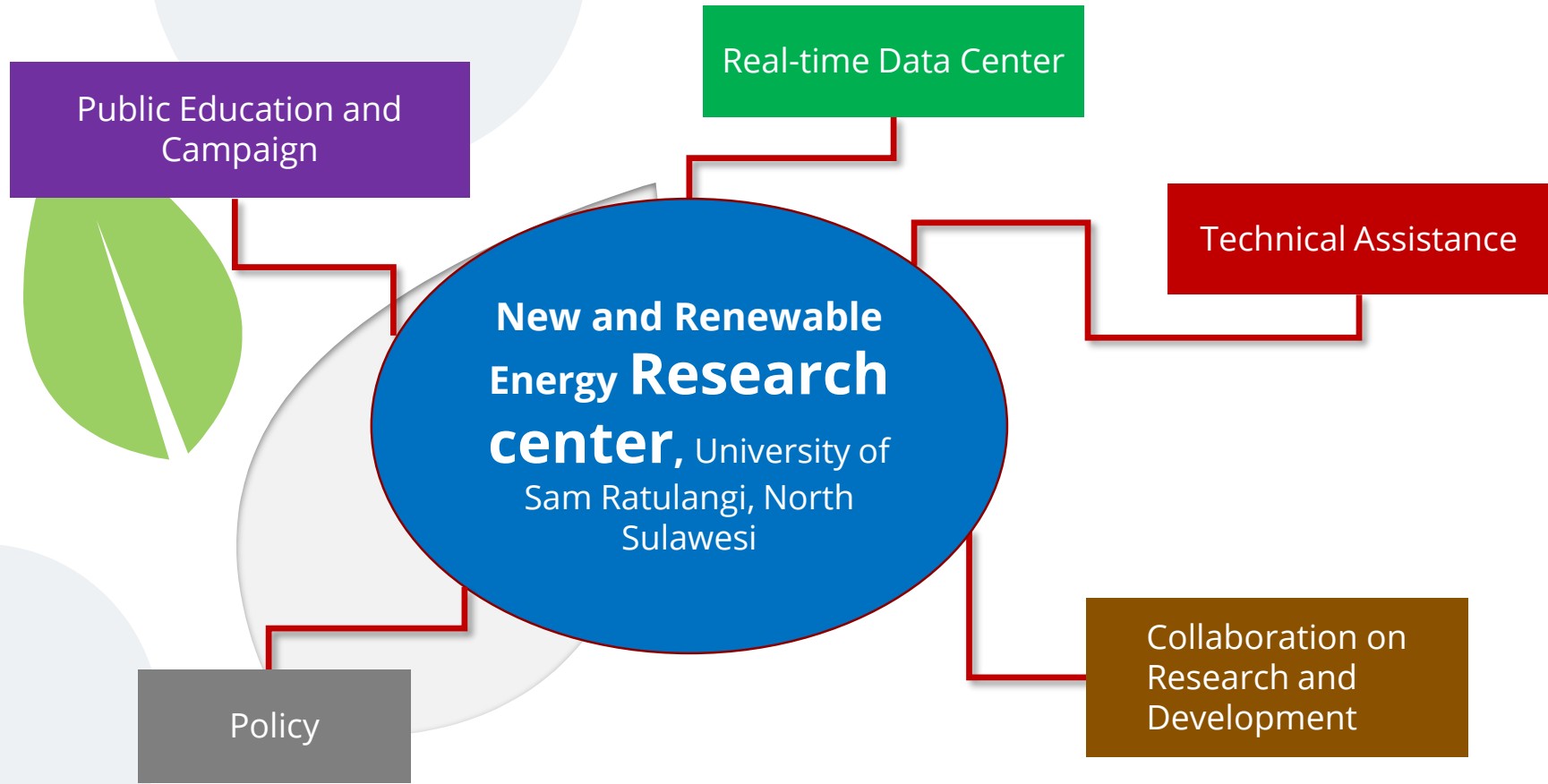
Based on
 TYPE of
 SECTOR



Branches	2015	2020	2025	2030	2035	2040	2045	2050
Industrial	45	90	174	245	334	442	572	729
Transportation	545	675	822	969	1.128	1.300	1.489	1.706
House	130	223	328	387	451	515	582	648
Commercial	47	95	184	262	361	486	640	834
Other Sectors	7	9	12	15	17	19	21	22
Total (x1000 TOE)	774	1.093	1.520	1.877	2.291	2.763	3.305	3.939

TOE: Tonnes of Oil Equivalent

Source: National Energy Planning, 2017



INSTITUTIONAL PARTNERSHIP



GOVERNMENT | **Orther UNIVERSITIES**

NATIONAL and INTERNASIONAL



- **Academic Program**
- **Collaborative Research**
- **Empowerment and Development**
- **Other Cooperative**

INFORMATION CONTACT

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Thank You

Danke

Terima Kasih

Tak

Gracias

Arigato

Xie-xie

Salamot

Efcharisto

Danyavad

Takk fyrir

Syukron

Toda

Khap kun kop

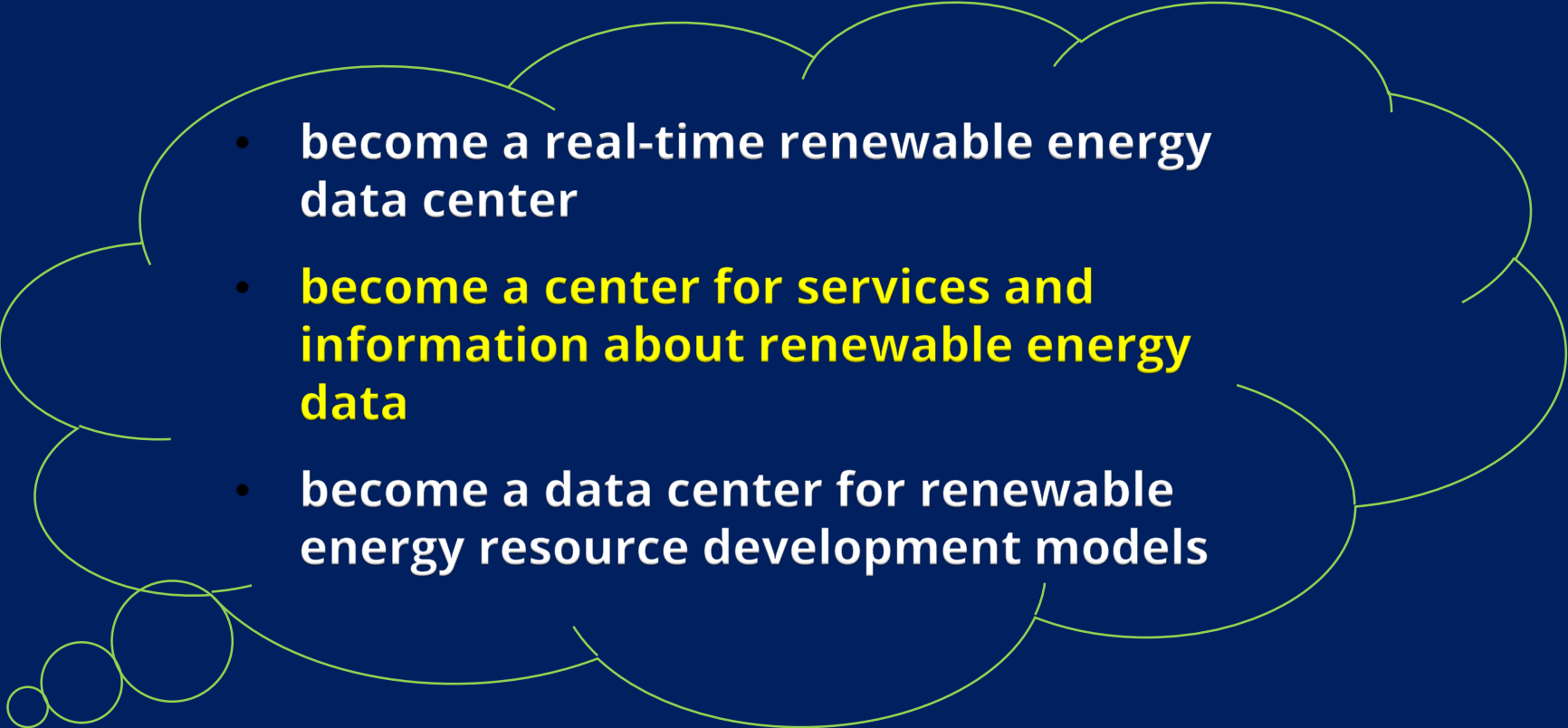
Merci

Kam Ouen

Mahalo

- **Minimizing the use of fossil energy by maximizing the utilization of renewable energy**
- **Optimizing the utilization of potential renewable energy resources (hydro energy, wind energy, solar energy, geothermal energy, biomass energy, marine energy, ...)**

- *Meminimalisasi penggunaan energi fosil melalui pemanfaatan energi terbarukan.*
- *Optimalisasi pemanfaatan potensi sumber-sumber energi terbarukan (energi sumberdaya air, energi angin, energi panas bumi, energi matahari, ...)*

- 
- **become a real-time renewable energy data center**
 - **become a center for services and information about renewable energy data**
 - **become a data center for renewable energy resource development models**

- *Pusat data energi terbarukan secara real time (data angin, data gelombang, data potensi geotermal, data potensi sungai, ...)*
- *Pusat pelayanan dan informasi data energi terbarukan*
- *Pusat data model-model pengembangan sumber daya energi terbarukan*

- **become a center of service assistance / technical consultation planning, development and utilization of renewable energy**

- *Pusat pelayanan jasa/konsultasi teknis dalam perencanaan dan pengembangan pemanfaatan energy terbarukan*

- **become a center of cooperation and collaboration in renewable energy research, innovation, modeling and development**

- *Pusat kerjasama kemitraan dalam penelitian, inovasi, permodelan dan pengembangan energy terbarukan*

This research center will educate publics about the importance of renewable energy utilization to replace fossil fuel.

- become a motor of change and behavior formation on the benefits of renewable energy use

- *Pembentukan perilaku dan karakter menyangkut pengetahuan tentang manfaat pemanfaatan energy terbarukan*