

# *RE/Green Education Program in Indonesia: Case Study at IPB*



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# Target of RE contribution to Indonesia energy mix

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No.	Energy	Contribution to energy mix	
		2004	2025 (target)
1	Oil	52.50%	≤ 20%
2	Gas	19.04%	≥ 30%
3	Coal	21.52%	≥ 33%
4	Biofuel	0%	≥ 5%
5	Geothermal	3.01%	≥ 5%
6	Others renewable energy (Biomass, Solar, Wind, Nuclear, Hydro)	3.93%	≥ 5%
7	Coal Liquefaction	0%	≥ 2%

RE resource	2005	2025
Geothermal	807 MW	9.500 MW
Microhydro	84 MW	500 MW (On Grid), 330 MW (Off Grid)
Solar Energy	8 MW	80 MW
Wind Energy	0,5 MW	250 MW (On Grid), 5 MW (Off Grid)
Biomass (electricity)	302 MW	810 MW
Biodiesel		5% total diesel oil consumption (4,7 mio KL)
Gasohol		5% total gasoline consumption
Bio Oil		2,5% total consumption of fuel oil and IDO

PRO-GROWTH  
PRO-JOB  
PRO-POOR

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Renewable energy is more labor intensive than fossil fuels or nuclear power

Workforce : 106 million-person

Unemployment rate : 11.6 million (10.6%)

Under-unemployment (<35 hours a week): 43 million (BPS, June 2006)

**The biodiesel project alone is expected to provide job for about 3 million people**

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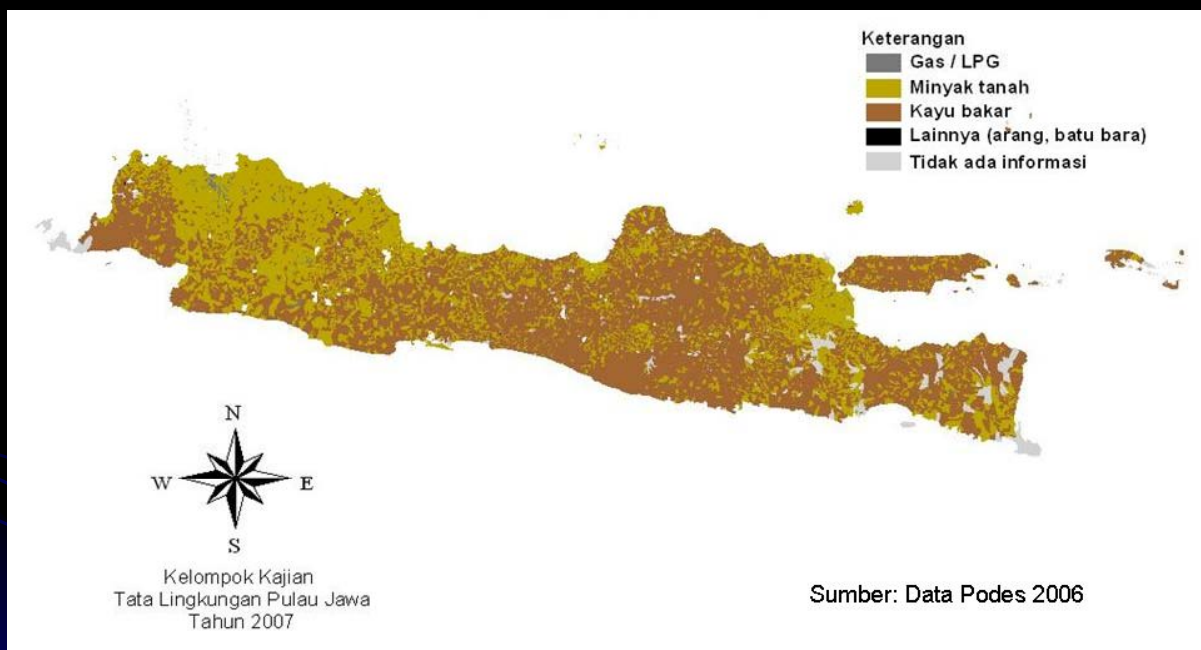
# Survey on company's preference to fresh graduates

No	Competence	Score
1	Ability to follow recent development of technology	122
2	Well understanding on mathematical analysis	121
3	Organizational skill	113
4	Managerial skill	108
5	English fluency	106
6	Understand the basic agriculture	102
7	Able to apply his knowledge and skill in productive activity and community services	102
8	Able to plan the utilization of machinery in agricultural activity	102
9	Able to conduct simple research and interpret the data obtained	98
10	Understand the mechanical principles.	94

No. of respondent: 49 companies/BUMN/gov. institutions  
 Score: level of preference (1-4 with 4 as the most preferred)

Job Profile in Renewable Sector is promising

# Renewable energy in rural area



Firewood is still the main energy source for rural households, especially for cooking, and its share tends to increase

Energy need	Fuels required	Fuels displaced	MDGs served								
			1	2	3	4	5	6	7	8	
Cooking, food preparation, storage, transportation, etc.	LPG, kerosene, natural gas, biogas, electricity, petrol, diesel, CNG.	Fuelwood, crop residues, dung, charcoal.	✓		✓	✓	✓			✓	
Lighting, appliances, motive power, machinery, etc.	Electricity	Kerosene, batteries, manual and animal power.	✓	✓	✓				✓		✓
Agro/food processing, irrigation, productive enterprises, etc.	Electricity, diesel, mechanical wind and hydro.	Manual and animal power.	✓	✓	✓			✓			✓

- Goal 1: Eradicate extreme poverty<sup>25</sup> and hunger
- Goal 2: Achieve universal primary education
- Goal 3: Promote gender equality and empower women
- Goal 4: Reduce child mortality
- Goal 5: Improve maternal health
- Goal 6: Combat HIV/AIDS, malaria and other diseases
- Goal 7: Ensure environmental sustainability
- Goal 8: Develop a Global Partnership for Development



**Community empowerment activity  
 also needs a good knowledge on  
 renewable energy**

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## Case: Bogor Agricultural University (Institut Pertanian Bogor)

### Green Education



- Laboratory of Agricultural Energy and Rural Electrification was founded in the Dept. Agricultural Engineering-IPB more than 25 years ago
- Renewable Energy topics has been adopted in Agricultural Engineering Curriculum in IPB, undergraduate as well as graduate level
- The Laboratory has performed various research in renewable energy



# A little of everything versus everything about a little

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RE specialization  
(eg: MSc in Renewable Energy)

Courses on renewable energy in a  
certain study program

Knowledge on Sustainable Energy  
Technologies incorporated in the all curricula

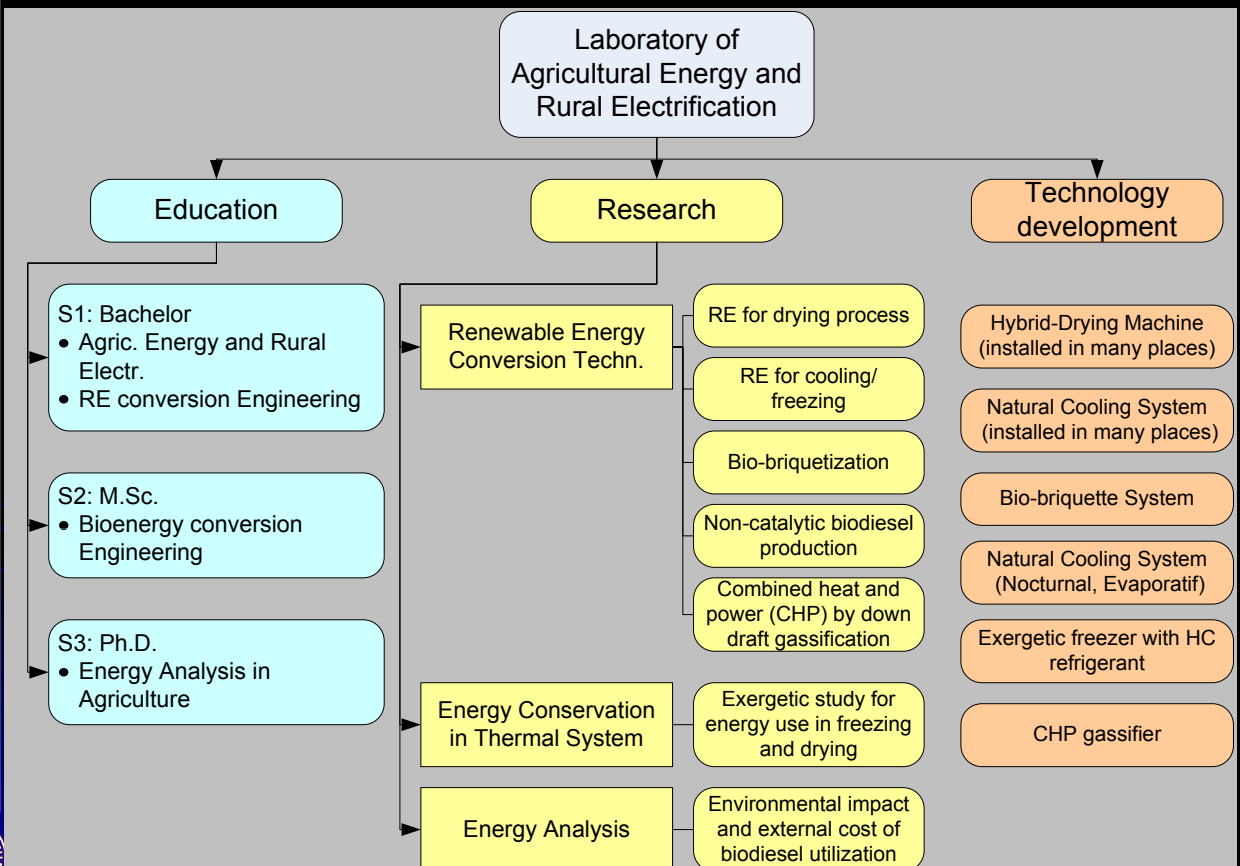


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## Activity of AERE Laboratory

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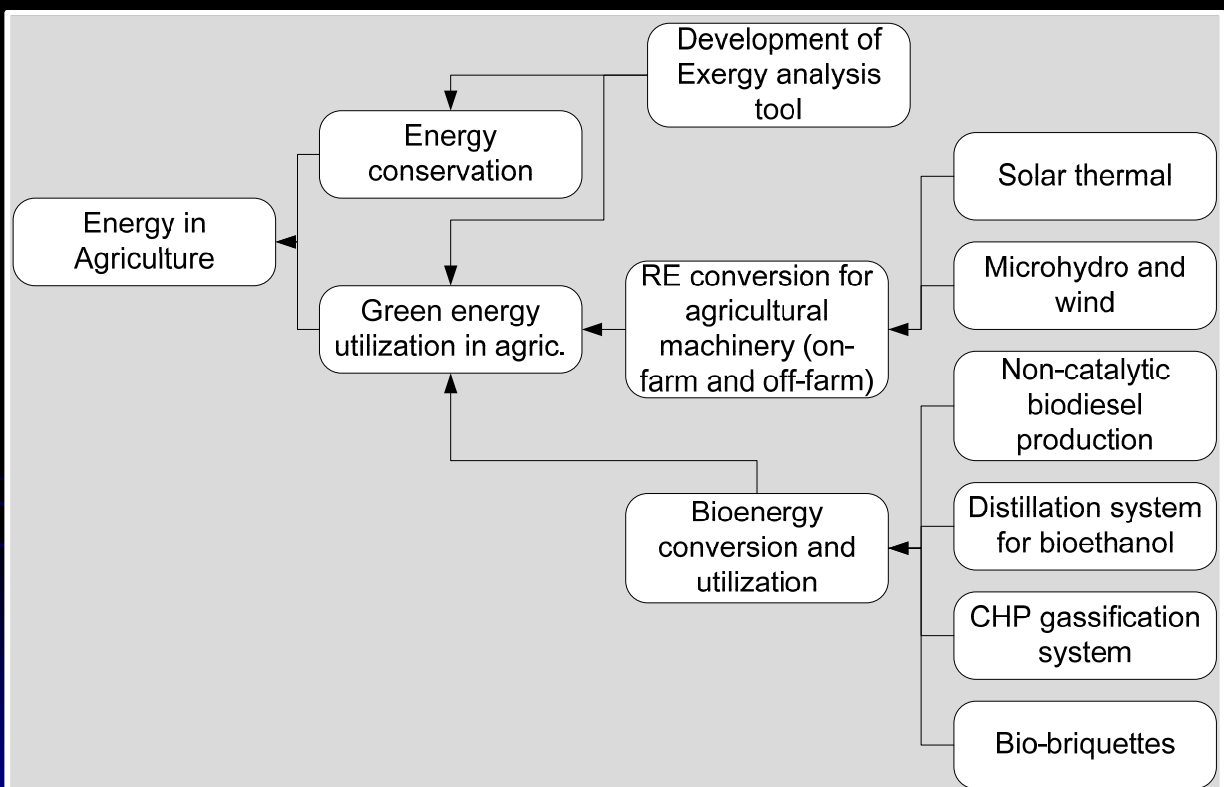


# Curriculum

The RE related courses combines:

- a sound technological basis of classical energy conversion systems,
- the transport phenomena behind renewable energy systems based on biomass, wind, solar energy and microhydro as possible future energy carriers,
- how sustainable systems need to interact in a built environment,
- understanding of economy, society and their role in changes in the energy sector

# Research





# Extra-curriculum

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Scetching the map of river in the campus

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# Conclusion and Recommendation

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1. RE education is prospective not only for jobs, but more important is to have a critical mass of graduates with good awareness in renewable energy
2. The RE education can be started by incorporating the knowledge in sustainable energy into the existing curricula



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# Thank you

# Terimakasih

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