

Economic & Environmental Aspects of Power System Developments within Asia-Oceania Region

Dr. Norkun Sitthiphong

**Chairperson of Asia-Oceania Regional Council of CIGRE
(AORC-CIGRE)**

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Outline

- 1) Overview of Asia-Oceania Regional Council (AORC)**
- 2) Connectivity & Collaboration**
- 3) Sustainable Development**
- 4) Environmental Management**
- 5) Conclusion**

Overview of AORC

AORC – CIGRE Member Countries



Australia



China



India



Indonesia



Iran



Japan



South Korea



Malaysia



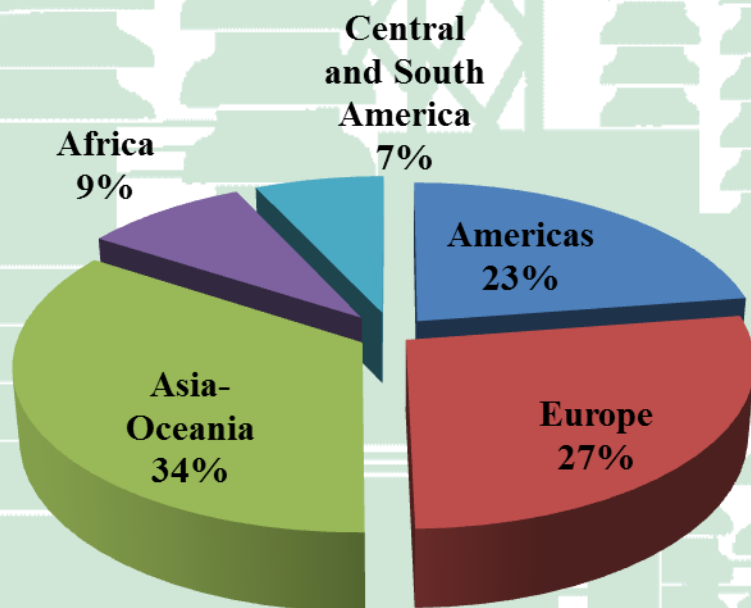
New Zealand



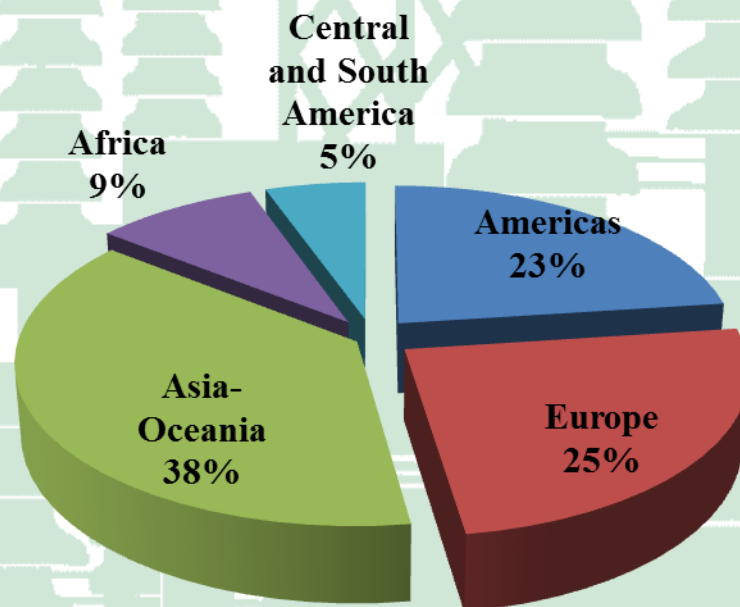
Thailand

Overview of AORC (cont.)

Gross Domestic Product



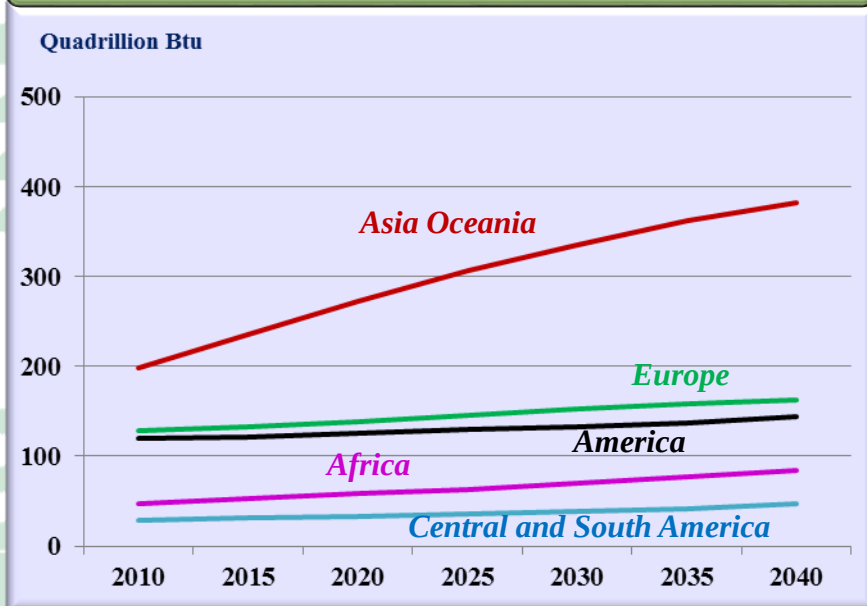
Energy Consumption



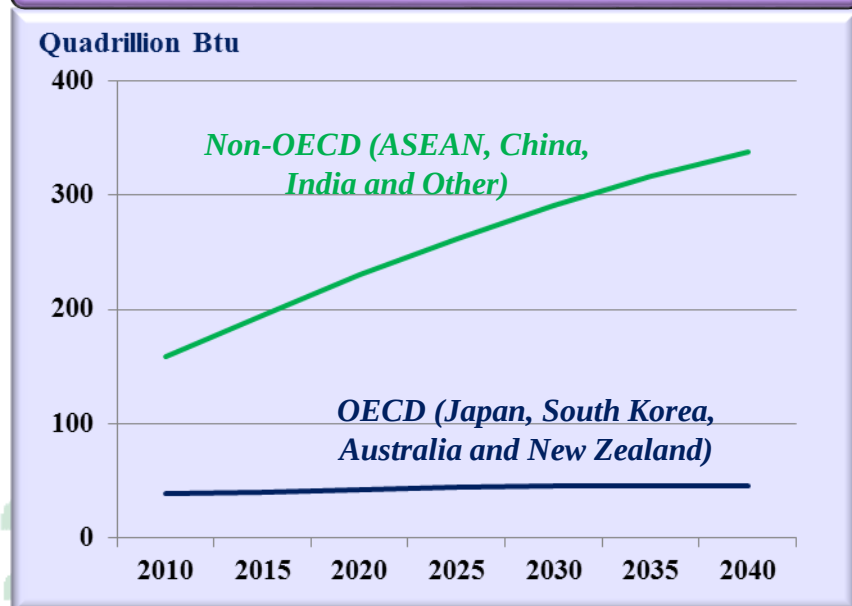
Overview of AORC (cont.)

Energy Demand Projection : Comparing to Other Regions

Compared with Other Regions



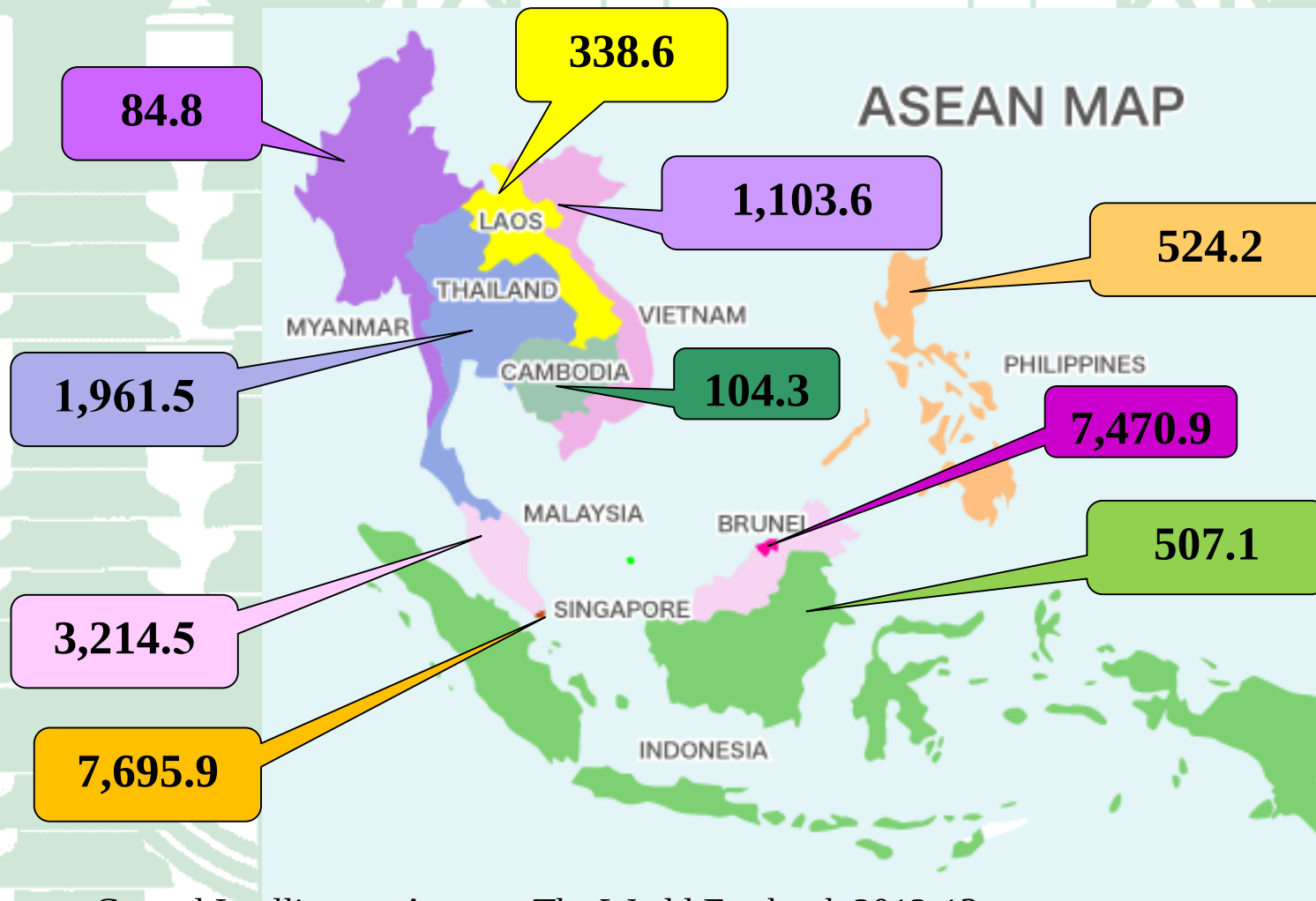
Difference in Asia-Oceania



- Asia-Oceania has led world energy demand growth.
- Asia Oceania's share in world energy demand increases from 38 % to 51 % in 2040

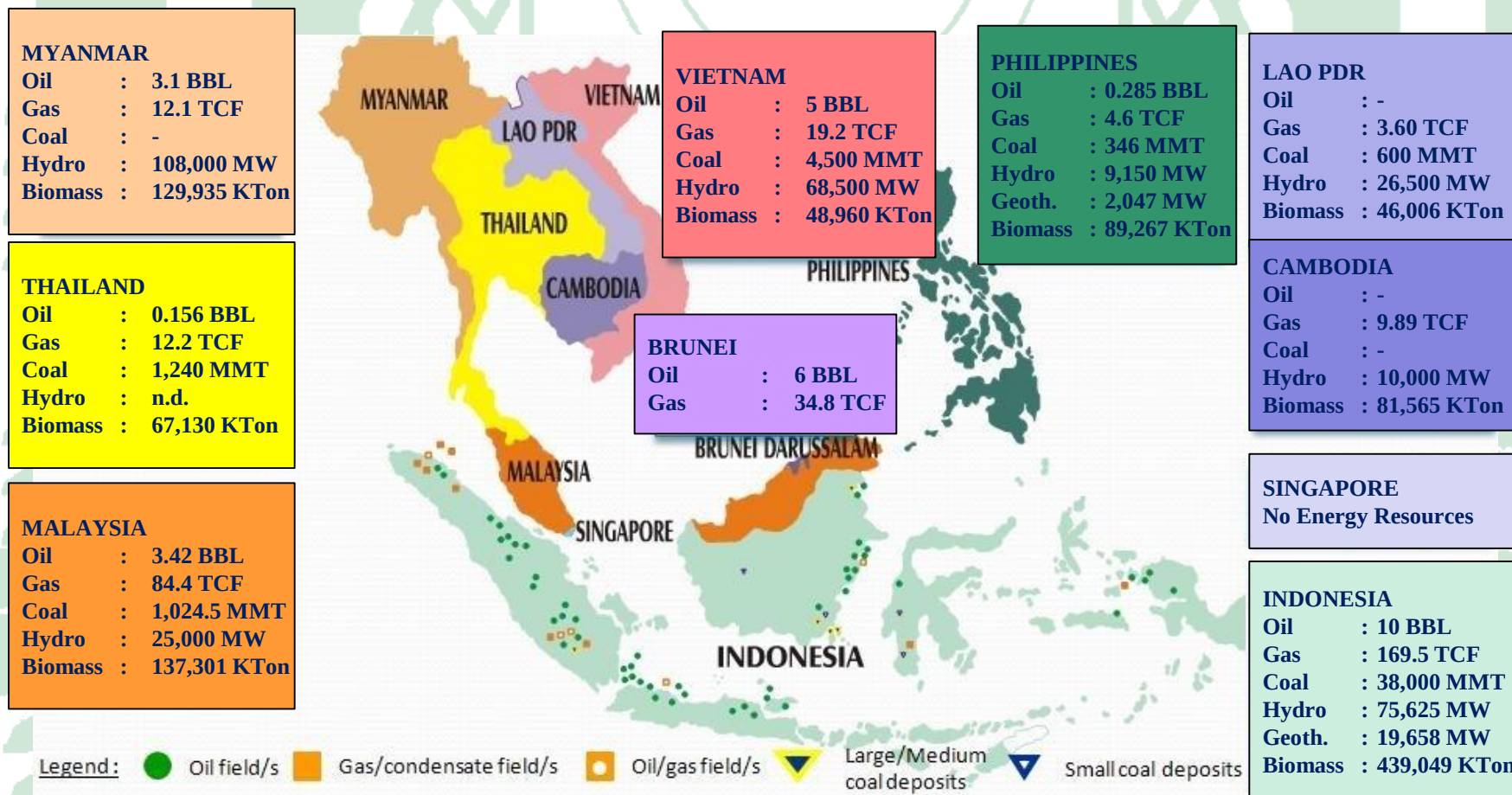
Overview of AORC (cont.)

Electricity Consumption per capita (kWh/person): ASEAN



Overview of AORC (cont.)

Potential Resources in ASEAN



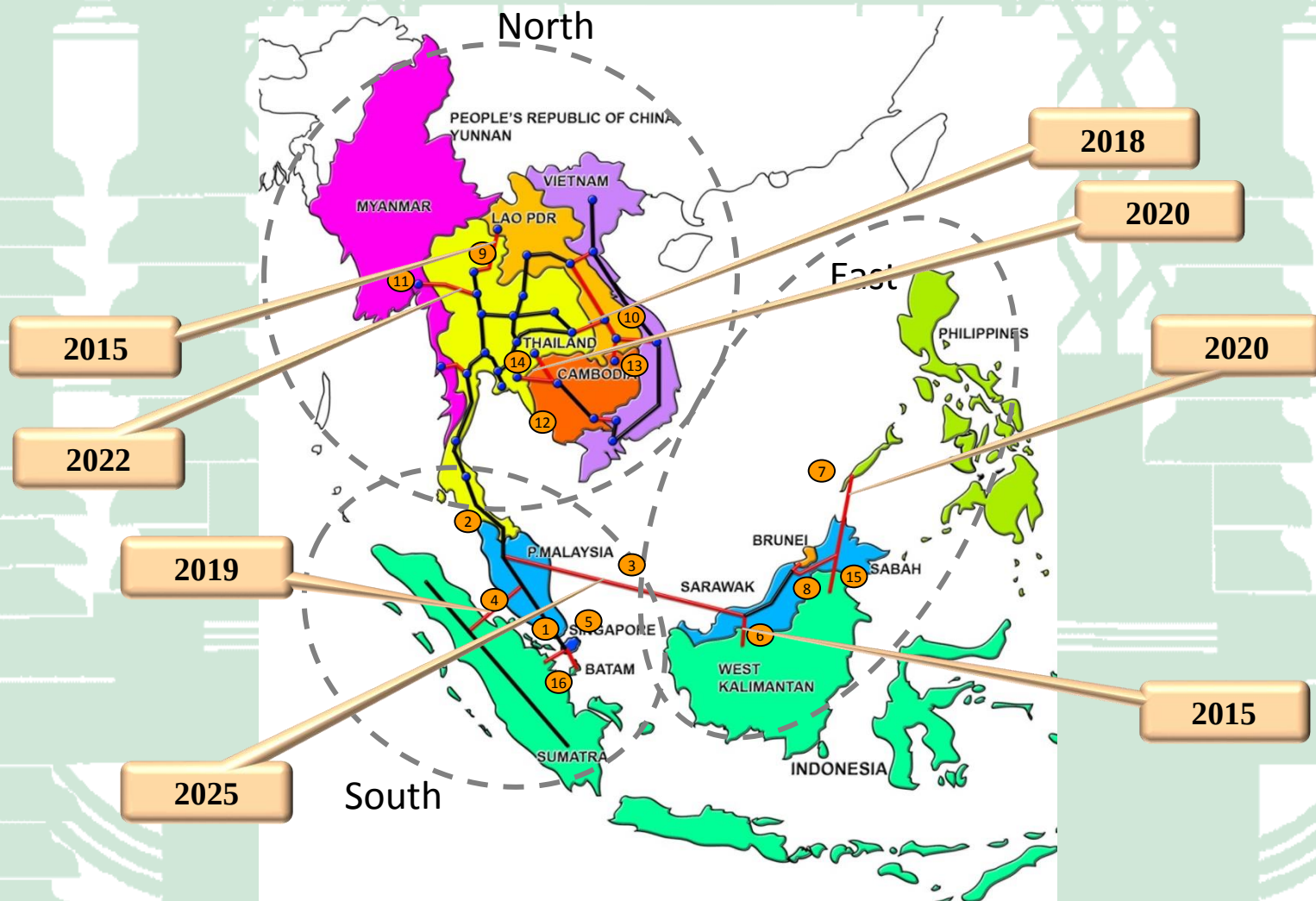
Connectivity & Collaboration

Association of South East Asia Nations (ASEAN)



Connectivity & Collaboration (cont.)

ASEAN Interconnection Master Plan



Connectivity & Collaboration (cont.)

Strategies of ASEAN Power Grid

in ASEAN Plan of Action for Energy Cooperation 2010 – 2015

- **Accelerate the development of the ASEAN Power Grid**
Interconnection projects
- **Optimize the generation sector vis-à-vis the available indigenous energy resources in the region**
- **Encourage and optimize the utilization of ASEAN resources, such as, funding, expertise and products to develop the generation, transmission, and distribution sectors**

Connectivity & Collaboration (cont.)

Benefits of ASEAN Interconnection

Items	Total Expenses (MUSD) *		Savings (MUSD) *
	Without Interconnection	With Interconnection	
Capital Costs	83,699	81,980	1,719
Fuel Costs	253,025	252,871	154
Total	336,724	334,851	1,873

Note: * Present value at year 2009

Sustainable Development

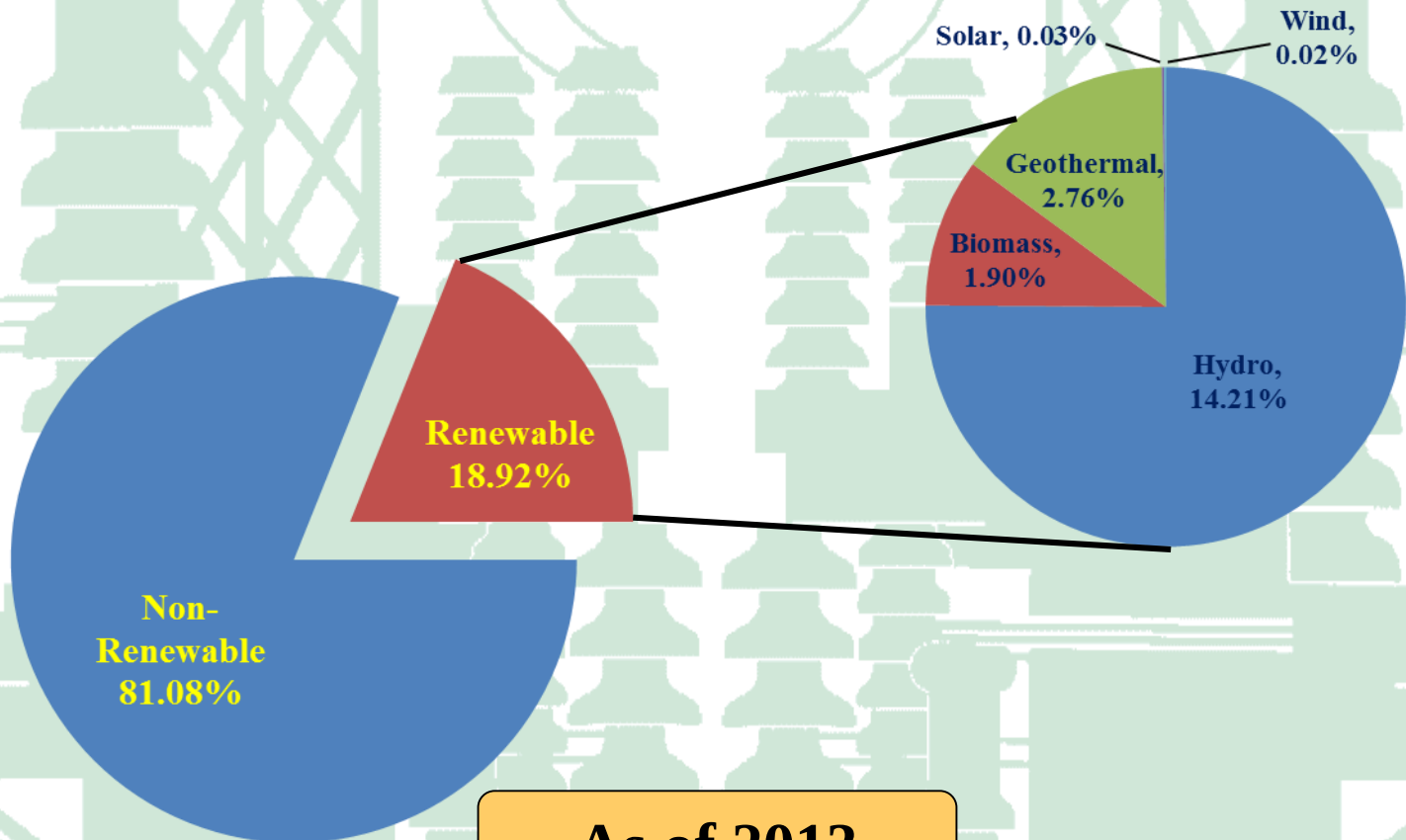
ASEAN Vision 2020

“Establish interconnecting arrangements in the field of energy and utilities for electricity, natural gas and water within ASEAN through the ASEAN Power Grid and a Trans-ASEAN Gas Pipeline and Water Pipeline, and **promote cooperation in energy efficiency and conservation, as well as the development of new and renewable energy resources**”



Sustainable Development (cont.)

Share of Renewable Energy for Electricity Generation in ASEAN



Sustainable Development (cont.)

**ASEAN PLAN OF ACTION FOR ENERGY
COOPERATION 2010 – 2015 (APAEC 2010 – 2015)**

*“Bringing Policies to Actions: Towards a Cleaner,
more Efficient and Sustainable ASEAN Energy Community”*

Sustainable Development (cont.)

ASEAN Strategies of Energy Efficiency and Conservation

- **Develop Energy Efficiency Policy and Build Capacity**
- **Enhance awareness raising and dissemination of information**
- **Promote good energy management practices, especially for industrial and commercial sectors**
- **Facilitate Energy Efficiency Financing**

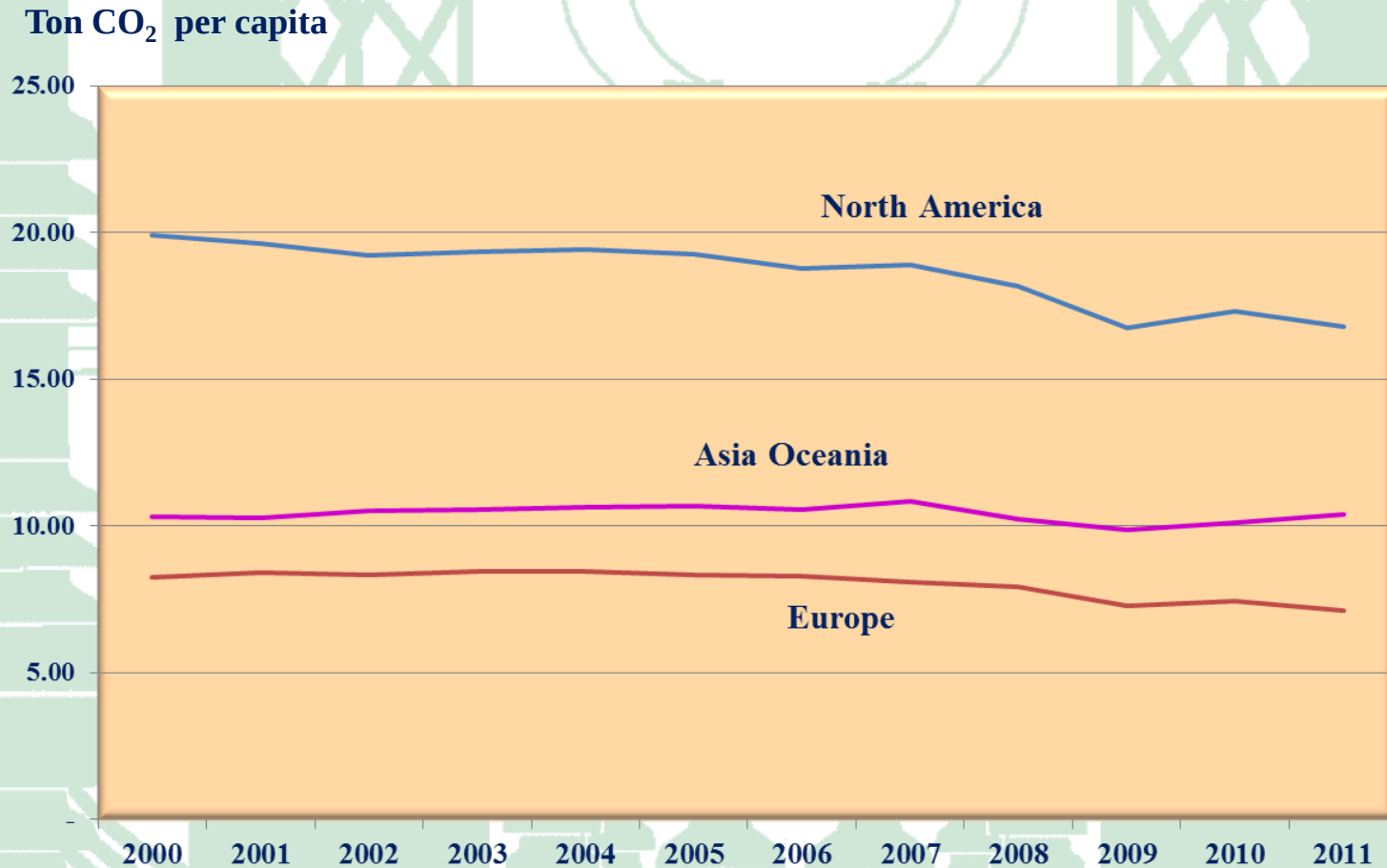
Sustainable Development (cont.)

ASEAN Strategies of Renewable Energy

- **Increase the development and utilization of RE sources to achieve the 15% target share of RE in ASEAN power generation mix**
- **Enhance awareness and information sharing and strengthen networks**
- **Promote intra-ASEAN cooperation on ASEAN-made products and services**
- **Promote renewable energy financing scheme**
- **Promote the commercial development and utilization of biofuels**
- **Develop ASEAN as a hub for renewable energy**

Environmental Management

Carbon Emission of Asia-Oceania



Source: International Energy Agency (IEA)

Environmental Management (cont.)

Carbon emissions savings through the substitution of gas-fired generation in Thailand and coal/gas-fired generation in Vietnam with hydro power generated in Cambodia, Lao PDR and Myanmar.



Environmental Management (cont.)

Environmental impacts assessment (EIA) is applied primary to prevent or minimize the adverse effects of hydro projects



*To integrate Environmental Consideration into
Decision Making Process*

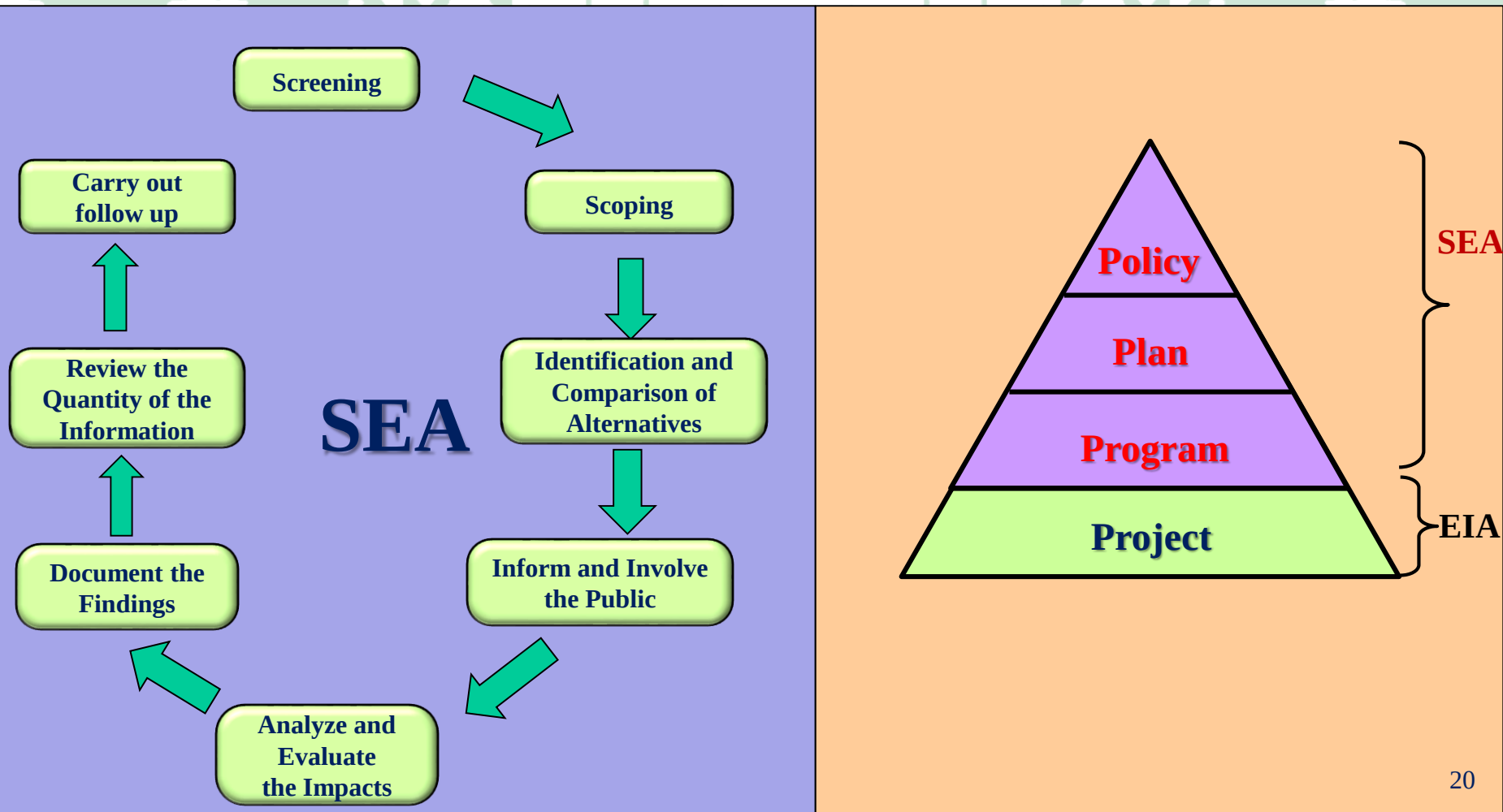


Strategic Environmental Assessment (SEA)

- **Formal process of systematic analysis of the environmental effects of development policies, plan, and programs**
- **SEA process extends the aims of environmental impact assessment (EIA) upstream in the decision-making process, beyond the project level**

Environmental Management (cont.)

Integration of SEA into Environmental Management



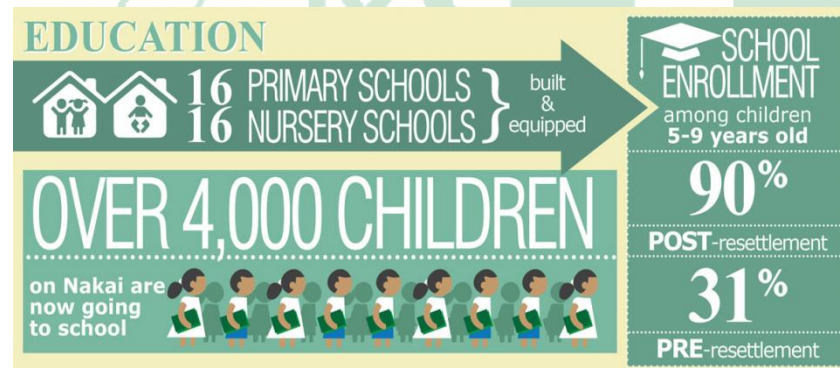
Environmental Management (cont.)

Nam Theun 2 Hydropower Project Case Study (1,000 MW)

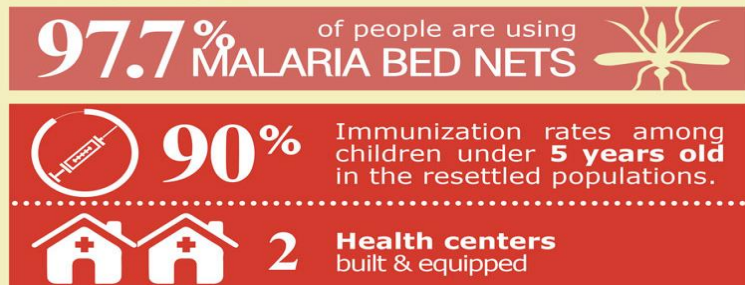


Environmental Management (cont.)

Nam Theun 2 Project Results



HEALTH



NUTRITION



Conclusion

- **Energy consumption in AORC has grown much more rapidly than other regions.**
- **The aim to harmonize energy consumption and variety of energy resources lead to connection and collaboration within AORC.**
- **Connection and collaboration can result in effective management of energy resources.**

Conclusion (cont.)

- **Power system development in AORC is moving towards cleaner, more efficient and sustainable communities.**
- **Environmental aspects are carefully deployed throughout the development process, starting from the decision making level to the project construction.**

**THANK YOU FOR YOUR
ATTENTION**