

9th REGIONAL LEADERS' SUMMIT

Energy Transition: Towards a Low Carbon Economy

Monitoring on Renewable Energy in the RLS regions

Sebastian Goers

Energieinstitut at the Johannes Kepler University Linz

Department of Energy Economics

Québec City, May 17th 2018

Regional Renewables Alliance – Joint Research Project



RLS Energy Network



Objective

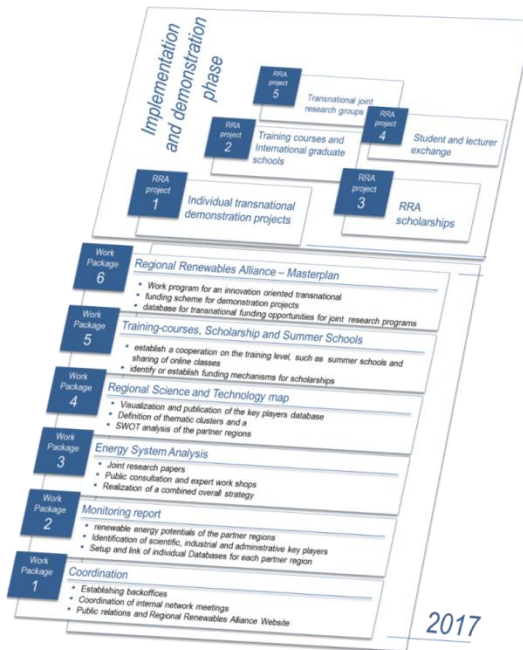
To promote the global integration, storage and transportation of renewables energies

Implementation

- Monitoring
- Energy System Analysis
- Technology Map
- Training & Exchange
- Master Plan

Monitoring report

Data on renewable energy resources, technologies and key players in science and industry



9th REGIONAL LEADERS' SUMMIT

Energy Transition: Towards a Low Carbon Economy

Québec City, May 17th 2018

Monitoring on Renewable Energy in the RLS regions

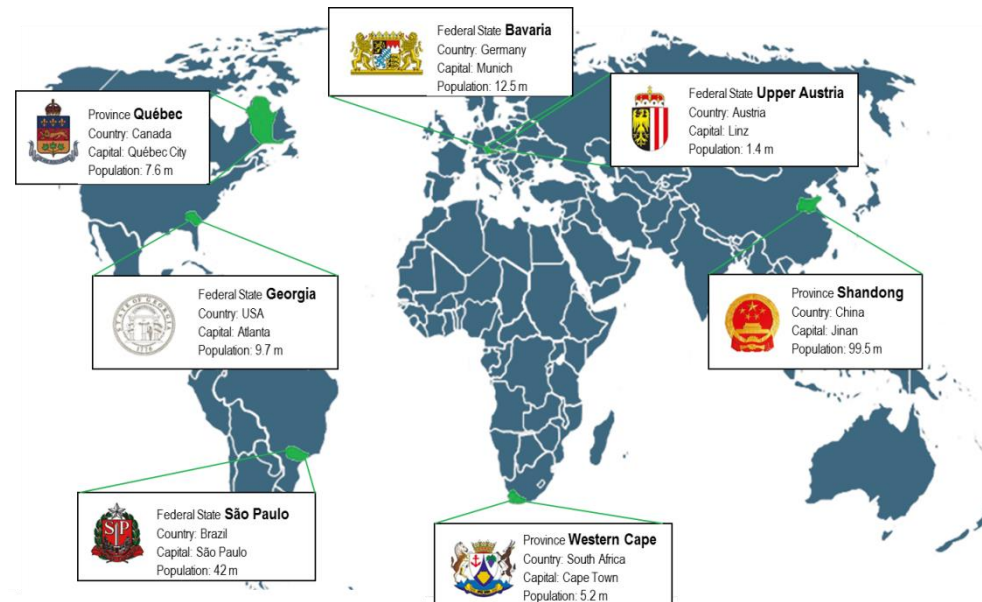


RLS Energy Network

Methodology



Multiregional and multilevel cooperation for data collection



9th REGIONAL LEADERS' SUMMIT

Energy Transition: Towards a Low Carbon Economy

Québec City, May 17th 2018

Monitoring on Renewable Energy in the RLS regions



RLS Energy Network

Methodology

RLS ENERGY NETWORK DATABASE	
Data collection with focus on	
1) ENERGY OVERVIEW	Unit Converter & Exchange Rates
2a) WIND - DATA	8a) HYDROGEN & FUEL CELLS - DATA
2b) WIND - REGULATORY FRAMEWORK	8b) HYDROGEN & FUEL CELLS - REGULATORY FRAMEWORK
2c) WIND - FORECAST	8c) HYDROGEN & FUEL CELLS - FORECAST
2d) WIND - RESEARCH	8d) HYDROGEN & FUEL CELLS - RESEARCH
Renewable energy production	9a) GEOTHERMAL - DATA
3a) SOLAR THERMAL - DATA	9b) SOLAR THERMAL - REGULATORY FRAMEWORK
3b) SOLAR THERMAL - REGULATORY FRAMEWORK	9c) GEOTHERMAL - FORECAST
3c) SOLAR THERMAL - FORECAST	9d) GEOTHERMAL - RESEARCH
3d) SOLAR THERMAL - RESEARCH	
Wind	10a) GRIDS - DATA
4a) PHOTOVOLTAIC - DATA	10b) GRIDS - REGULATORY FRAMEWORK
4b) PHOTOVOLTAIC - REGULATORY FRAMEWORK	10c) GRIDS - FORECAST
4c) PHOTOVOLTAIC - FORECAST	10d) GRIDS - RESEARCH
4d) PHOTOVOLTAIC - RESEARCH	
Solar	11a) ENERGY STORAGE & SYSTEM INTEGRATION - DATA
5a) BIOENERGY - DATA	11b) ENERGY STORAGE & SYSTEM INTEGRATION - REGULATORY FRAMEWORK
5b) BIOENERGY - REGULATORY FRAMEWORK	11c) ENERGY STORAGE & SYSTEM INTEGRATION - FORECAST
5c) BIOENERGY - FORECAST	11d) ENERGY STORAGE & SYSTEM INTEGRATION - RESEARCH
5d) BIOENERGY - RESEARCH	
Biomass	12a) ENERGY EFFICIENCY - DATA
6a) BIOFUELS - DATA	12b) ENERGY EFFICIENCY - REGULATORY FRAMEWORK
6b) BIOFUELS - REGULATORY FRAMEWORK	12c) ENERGY EFFICIENCY - FORECAST
6c) BIOFUELS - FORECAST	12d) ENERGY EFFICIENCY - RESEARCH
6d) BIOFUELS - RESEARCH	
Hydro	12) GEOGRAPHICAL DATA
7a) HYDRO - DATA	13) CLIMATE DATA
7b) HYDRO - REGULATORY FRAMEWORK	14) DEMOGRAPHIC DATA
7c) HYDRO - FORECAST	15) MACROECONOMIC DATA
7d) HYDRO - RESEARCH	16) NATIONAL CONTEXT

Edition: January 2018, ©Energieinstitut an der JKU Linz

Energy Overview - Data

Gross Inland Energy Consumption

by emergence		2005	2017	Source	Link
Domestic Primary Energy Production	PJ				
+ Primary Energy Imports	PJ				
+ Primary Energy Stock	PJ				
- Primary Energy Exports	PJ				
- GEINC	PJ				
by energy source		2005	2017	Source	Link
Gross Inland Energy Consumption*	PJ				
Coal	PJ				
Oil	PJ				
Gas	PJ				
Renewable Energy incl. Waste	PJ				
Electricity Exports (+) / Imports (-)	PJ				
Energy related GHG emissions	1,000 t				

Solar Thermal - Data

		2005	2006	2017	Source	Link
Total Installed Solar Panels	m ²					
Annual Installed Solar Panels	m ²					
Active installed Capacity	MW (therm)					
Active Generated Annual Heat	GWh					
Solar Panels per per 1,000 capita	m ² /1,000					
		2005	2006	2017	Source	Link
Solar Panel Costs	US\$/m ²					
Annual Investment	m US\$					
Additional Value Added	m US\$					
by Operation	m US\$					
by Installation	m US\$					
Additional Employment	Employees					
Permanent Operation Staff	Employees					
Installation	Employees					

Demographic Data

		2005	2017	2030	Source	Link
Total Population	P (Persons)					
Population < 20 years	P					
Population > 20 years	%					
Population > 20 and < 65 years	P					
Population > 20 and < 65 years	%					
Population > 65 years	P					
Population > 65 years	%					
Total Private Households	HH (Households)					
Households with 1 Person	HH					
Households with 1 Person	%					
Households with 2 Persons	HH					
Households with 2 Persons	%					
Households with 3 Persons	HH					
Households with 3 Persons	%					
Households with 4 and more Ppersons	HH					
Households with 4 and more Ppersons	%					
Median Household Size	P					

9th REGIONAL LEADERS' SUMMIT

Energy Transition: Towards a Low Carbon Economy

Québec City, May 17th 2018

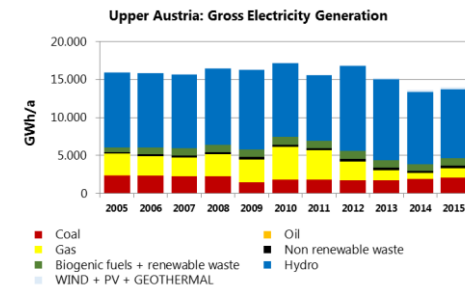
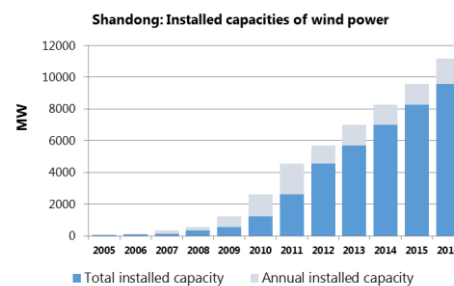
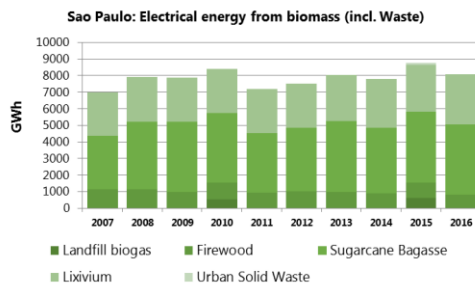
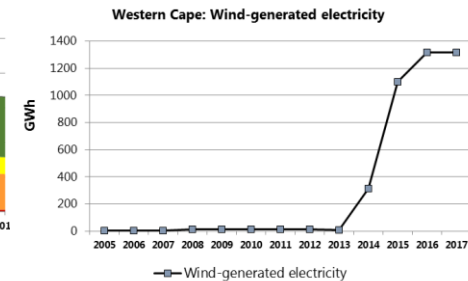
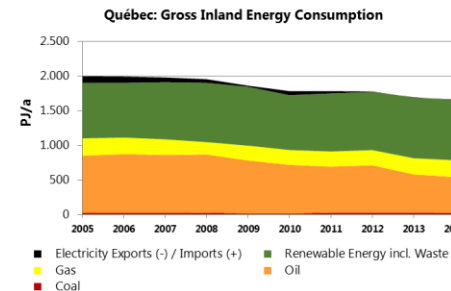
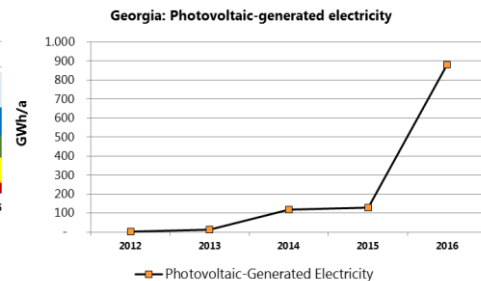
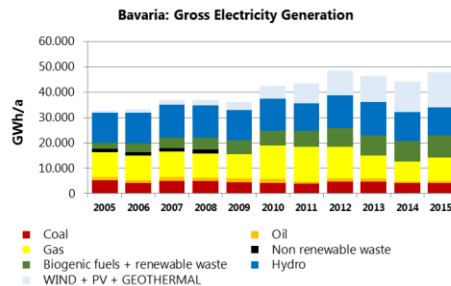
Monitoring on Renewable Energy in the RLS regions



RLS Energy Network

Exemplary results of data collection and processing

Integration of renewables into regional energy systems for **electricity, heat and fuel production**



9th REGIONAL LEADERS' SUMMIT

Energy Transition: Towards a Low Carbon Economy

Québec City, May 17th 2018

Monitoring on Renewable Energy in the RLS regions



RLS Energy Network

- **Comparability**
of the partner regions' energy systems through harmonized indicators
- **Gain of information**
on renewable energy resources, technologies and key players
- **Evidence-based data**
highlighting the potential for further action and its relevance
- **Use of data by interested companies and organizations**
- **Basis for targeted research and development investments**



Thank you for your attention!



RLS Energy Network

Dr. Sebastian Goers

Energieinstitut at the Johannes Kepler University Linz
Department of Energy Economics
Upper Austria, Austria
goers@energieinstitut-linz.at



<https://www.rls-energynetwork.org/>

9th REGIONAL LEADERS' SUMMIT

Energy Transition: Towards a Low Carbon Economy

Québec City, May 17th 2018