



# The RLS-Energy Network

## Approaches for navigating the RLS regions' energy transitions during and after the COVID-19 crisis

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*on behalf of the RLS-Energy Network*

### RLS-Sciences Round Table on COVID-19

Virtual Meeting

September 15<sup>th</sup> 2020





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# Purpose

- As of March 2020, the COVID-19 pandemic has developed into a global public health emergency, in turn causing an immense economic crisis.
  - In response, governments have engaged in policy action aiming at containing the virus, providing effective healthcare, and preventing economic collapse.
  - The COVID-19 crisis emerged at a time when energy and climate policies were experiencing an increased momentum.
- 
- **This statement of the RLS-Energy Network's lead scientists and experts aims to support RLS policy makers via**
    - **displaying the impacts on the energy sector**
    - **offering crisis management, recovery approaches and exit strategies from science and practice focusing on regional transitions to low-carbon energy systems**



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# Background (I)



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## Energy Transitions in the RLS context:

6<sup>th</sup> Regional Leaders' Summit - "Sustainable Energy and Development"  
São Paulo, April 11-12<sup>th</sup>, 2012

- The RLS-Energy Network was initiated subsequent to the political RLS meeting in **São Paulo in 2012**. It was agreed among the participants that **renewable sources of energy require extensive research**.



(From left to right) São Paulo Governor Geraldo Alckmin, Secretary of Energy José Aníbal, and Undersecretary of Renewable Energy Milton Flávio Lautenschläger.  
Photo Credit: FAPESP

## The Québec Joint Declaration on Energy Transition

9<sup>th</sup> Regional Leaders' Summit, Québec, May 17<sup>th</sup>, 2018

- This declaration highlighted the **political commitment at the regional level**, with a goal for the regions to become **leaders in energy transition by 2030**, referring specifically to renewable energy and energy efficiency with the further aim of building a "new, strong, low-carbon economy". The **political leaders mandated the RLS-Energy Network to undertake work to support such transitions**.



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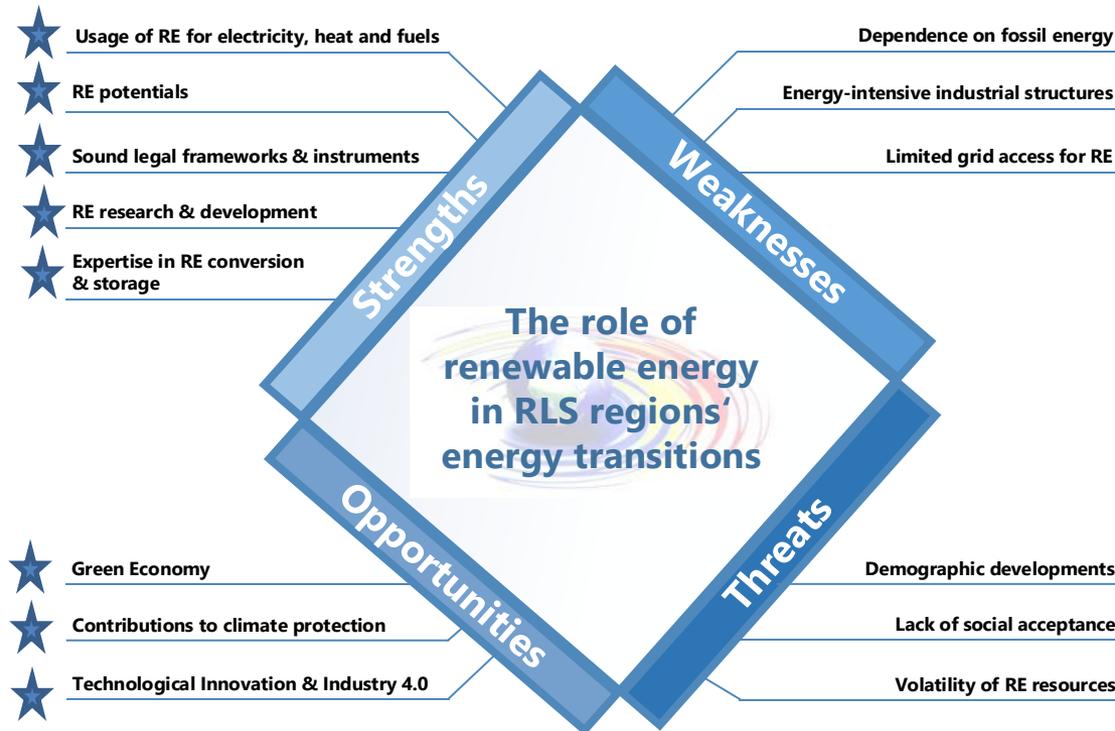
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# Background (II)



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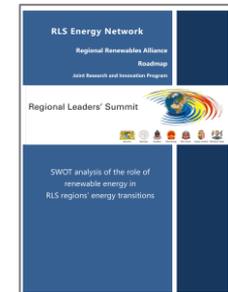
- RLS regions' energy transitions are analyzed by RLS-Energy Network partners of all 7 regions via the Roadmap "Regional Renewable Alliance"



Source: RLS-Energy Network (2020), SWOT analysis of the role of renewable energy in RLS regions' energy transitions.



Monitoring report



SWOT analysis

**RLS regions' strengths and opportunities of renewables in energy transitions offer ways to manage and recover from COVID-19 crisis' impacts**



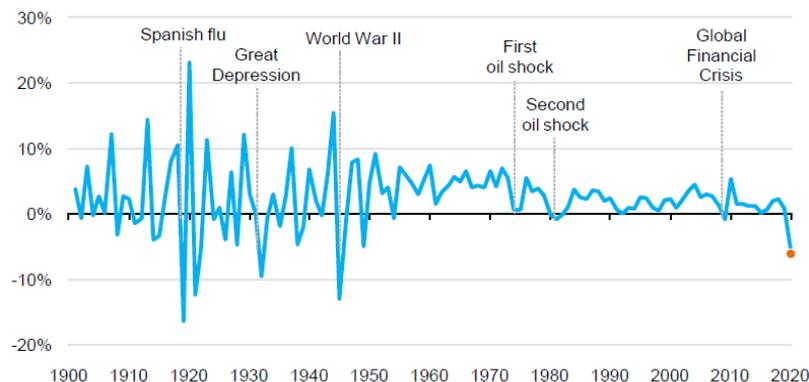
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# COVID-19 crisis' impacts on energy (I)

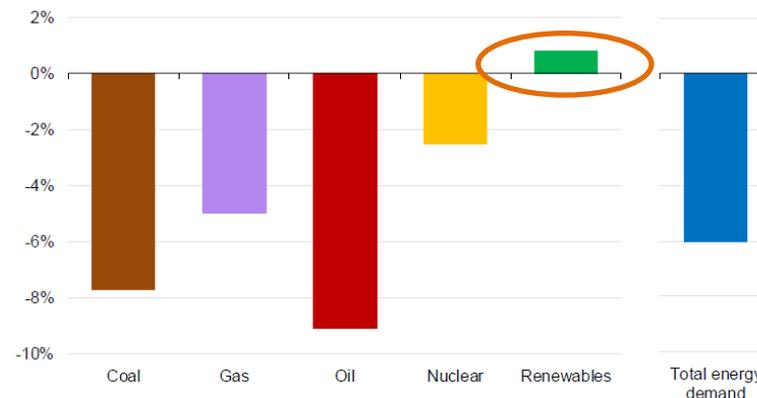
- Drastic restriction of global economic activity and mobility during first quarter of 2020 decreased global energy demand
- Renewable energy has proven to be more resilient than other parts of the energy sector due to larger installed capacity and priority dispatch.

Rate of change in global primary energy demand, 1900-2020



Source: IEA (2020)

Projected change in primary energy demand in 2020 relative to 2019



Source: IEA (2020)

**Renewables are not immune to the Covid-19 crisis, but are more resilient than other fuels.**

# COVID-19 crisis' impacts on energy (II)



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- Electricity systems with high shares of renewables continue to operate effectively.
- During the shutdown, the share of renewables in the electricity mix grew in many regions, since renewable power plants have close to zero marginal costs and thus make economic sense to be dispatched first.

**The 7 RLS regions integrate wind, solar, biomass, hydro and geothermal resources into their regional energy systems and utilize them for electricity.**

## Electricity generation in selected RLS partner regions, 2017

	Bavaria	Georgia	Québec	São Paulo	Shandong	Upper Austria
<b>Total (TWh)</b>	84.6	127.5	202.0	72.6	486.0	15.5
<b>Fossil</b>	55.9%	93.4%*	1.4%	10.2%	94.8%	27.7%
<b>Renewable</b>	44.1%	6.6%	98.6%	89.8%	5.2%	72.3%
Biomass	10.6%	3.9%	0.9%	27.9%	0.0%	6.2%
Hydro	14.4%	0.9%	93.4%	61.9%	3.4%	63.9%
Wind	5.4%	0.0%	4.2%	0.0%	1.5%	0.6%
Solar	13.3%	1.7%	0.0%	0.0%	0.3%	1.6%
Other	0.5 %	0.0%	0.0%	0.0%	0.0%	0.0%

\* incl. nuclear power

Source: RLS-Energy Network (2020), SWOT analysis of the role of renewable energy in RLS regions' energy transitions.



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# Using energy transitions frameworks as roadmap for stimulus and recovery over the short-, mid-term and beyond



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- **Policy measures and investments aiming at stimulus and recovery** can raise national and **regional energy transition** strategies as a significant step in constructing resilient economies and societies.
- Recovery measures could help to install flexible power grids, efficiency solutions, electric vehicle charging systems, energy storage, green hydrogen and multiple other clean energy technologies.
- The development of renewable energy has led to an increase in the number of related jobs in selected RLS regions:

**Bavaria** (2016): **50.600** renewable energy jobs

**Québec**: **20,000** people for the generation, transmission and distribution of electricity (Hydro-Québec) / **5,000** from wind turbine sector / **3,600** jobs from the development of the biomass heating value chain

**Shandong**: **300.000** jobs from renewable energy equipment manufacturing industry

**Upper Austria** (2016): **35.600** green jobs

*Source: RLS-Energy Network (2020), SWOT analysis of the role of renewable energy in RLS regions' energy transitions.*



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# COVID-19 crisis' interactions with regional energy transitions

Insights from Bavaria



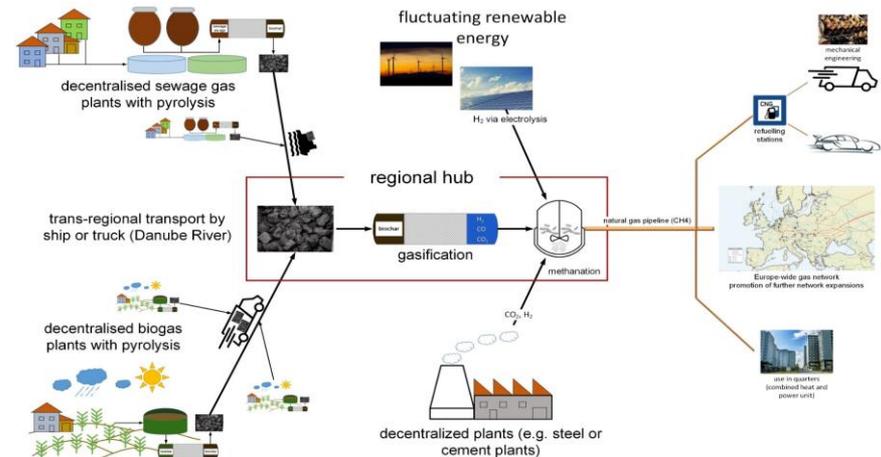
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COVID-19 crisis indicates that independent energy generation, expansion of renewables and energy security are crucial for the energy system

➔ The project **DanuP2Gas** focusses on **energy security** at **interregional** and **regional** levels

## Project goals:

- Integration of unused biomass and surplus renewable energy into the energy market
- Creation of transnational cooperation among research, business, energy planners, transport, etc.
- Enhance diversity of energy sources, storage and distribution strategies within the Danube Region



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# COVID-19 crisis' interactions with regional energy transitions

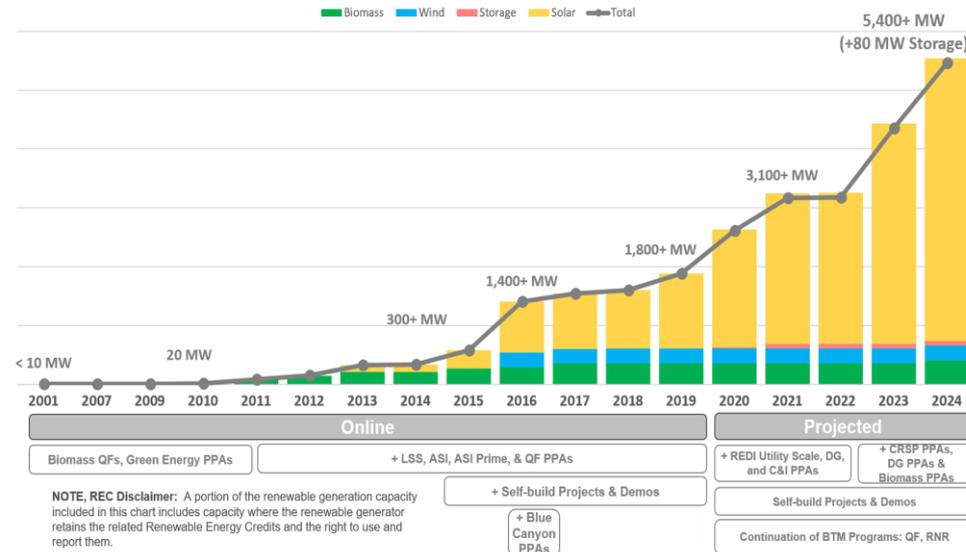
Insights from Georgia



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## COVID Response and Resilience

- Projected installed capacity of renewable energy



- Instruments and methodologies to analyze green stimulus recovery packages
  - Sustainable Communities Project: Online-tool to evaluate economic and environmental outcomes of new technologies and investment through web applications that use an economy-wide input-output model of industries, households and the environment
  - Sustainable Materials Management Project: Life cycle model of goods and services



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# COVID-19 crisis' interactions with regional energy transitions

Insights from Québec



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## Innovative Québec initiatives in the energy sector in the context of COVID-19

- **Transition énergétique Québec (TEQ)** announced improvements to its energy conversion, innovation and efficiency programs to support a **green and resilient recovery**.
- **Food sovereignty:** In the COVID-19 context, recovery efforts have fostered **collaborations among local stakeholders** and **food security or self-sufficiency** has given rise to promising energy-related initiatives.
  - Greenhouse Industry: Energy efficiency and production optimization represent major challenges. Greenhouse farming can be integrated into circular economy projects and could benefit from decentralised production and CO<sub>2</sub> capture on site.
  - Smart energy which leverage artificial intelligence technologies and optimization of the cultivation process are becoming highly attractive.
- **Local R&D for regional and international cooperation supporting energy transitions**
  - Réseau québécois sur l'énergie intelligente (RQEI) 
  - Centre interdisciplinaire de recherche en opérationnalisation du développement durable (CIRODD) 



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# COVID-19 crisis' interactions with regional energy transitions

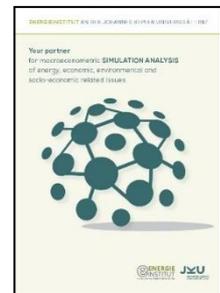
## Insights from Upper Austria



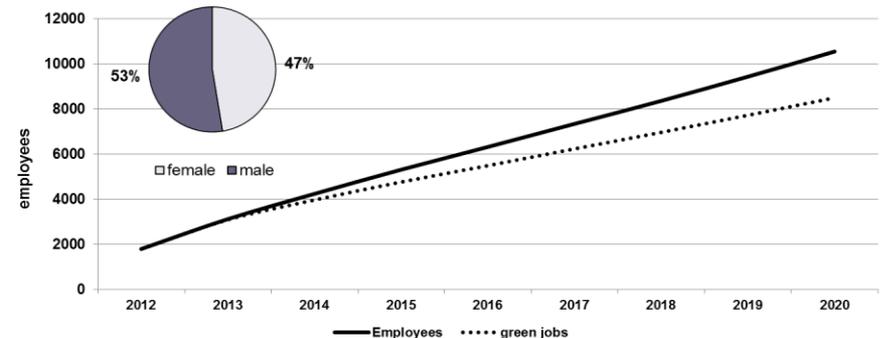
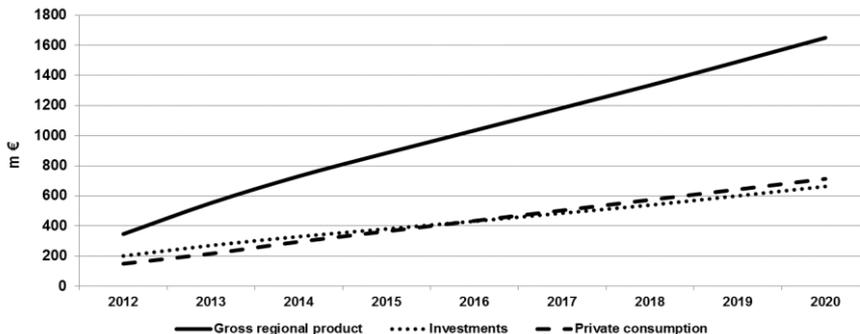
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### Measuring the multiple dividends for Upper Austria of sustainable energy technologies

Ex-post and ex-ante macroeconomic, socio-economic and ecologic **impact assessments of the Energieinstitut at the Johannes Kepler University of Linz** indicate that a double dividend by the means of achieving climate-friendly and economical / social goals simultaneously can be postulated in Upper Austria



#### Additional macroeconomic and employment effects in Upper Austria resulting from energy and climate policy measures (incl. renewables and energy efficiency)



Including **renewables** and **efficiency** in economic stimulus packages is justified by the structural benefits they can bring in **job creation, economic development & innovation** while **reducing emissions**.



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# COVID-19 crisis' interactions with regional energy transitions

## Insights from Western Cape



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### Investment into green economy infrastructure is a key element of economic recovery

Focus on **Small Scale Embedded Generation (SSEG)** – including wheeling and potentially trading of energy, energy efficiency, distributed generation, utility scale renewable energy, alternative service delivery and the promotion of electric vehicles.

Western Cape Provincial Government achieves this is through a **partnership with the green economy sector development agency, GreenCape**, which creates direct economic stimulus through :



- **Industrialization opportunities of renewable energy** development and increase of the effectiveness and efficiency of localisation in South Africa's renewable energy sector
- **Creating an environment for building of renewable energy infrastructure**
  - Recent focus on resolving rolling blackouts via **GreenCape's Alternative Service Delivery Unit (ASDU)**
  - supporting those communities located within informal settlements (example: free Wi-Fi enabled solar street lighting project in Witsand, an informal settlement in Cape Town)



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## Summary & Take-aways for RLS policymakers

- **Energy transitions are already underway in RLS regions.** By making the energy transition an integral part of the wider recovery strategy, political decisionmakers can realize a substantial progress towards health, inclusion, wealth and resilience.
- **Recovery and stimulus packages focused on energy transition** can help to overcome the economic collapse and generate much-needed jobs, both for the short-term and beyond.
- **Research and innovation** are vital to improve the technologies for energy transitions.
- While the COVID-19 crisis has strengthened the vision of a more resilient society at national and regional levels, **international cooperation** is needed to oppose deficits and vulnerabilities.

**RLS-Energy Network's scientists and experts from the 7 partner regions provide the knowledge and instruments from all relevant disciplines to support RLS policymakers in navigating energy transitions during and after the COVID-19 crisis.**



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# Thank you for your attention!

## RLS-Energy Network scientists and experts

### Bavaria

Prof. Ralf Ludwig  
Dr. Sebastian Fendt  
Dr. Reinhart Schwaiberg  
Fiona Rumohr

### Georgia

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## RLS-Sciences



Bavaria



Georgia



Québec



Shandong



São Paulo



Upper Austria



Western Cape

<http://www.rls-sciences.org/>

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