



GUARANTEES OF ORIGIN AS A SOURCE OF REVENUE FOR RENEWABLE ENERGY PROJECTS? INSIGHTS FROM EUROPE & THE US

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Strommarkttreffen
Berlin, 24 January 2020

Agenda

1 REGOs as a source of revenue

2 Situation in Germany and the EU

3 Situation in the US

4 Future outlook

RE projects need new financing strategies

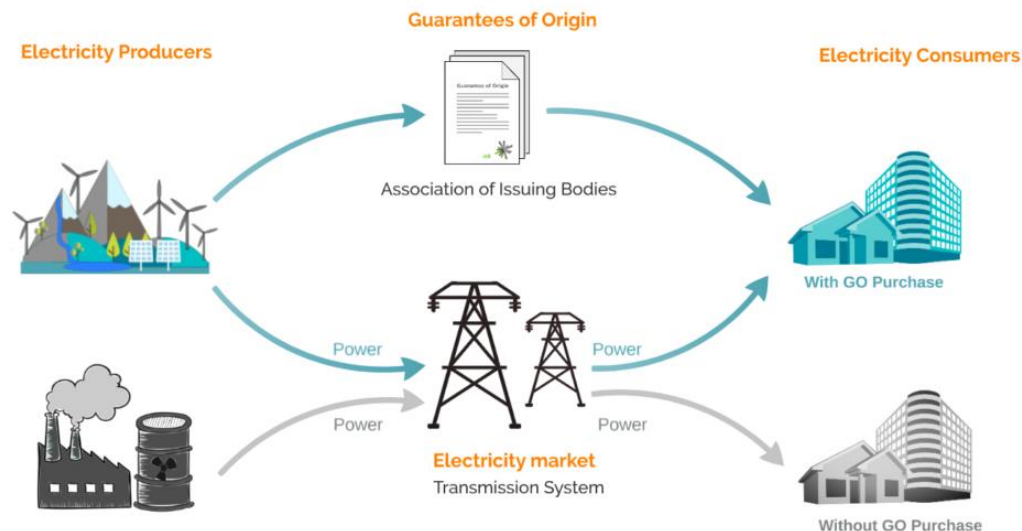
- We currently observe two trends:
 - i) Renewable energy projects (will) receive → How can **zero-subsidy projects** lower **subsidies** work?
 - ii) (Corporate) **demand** for RE is increasing → What are consumers **willing to pay**?



Are renewable energy projects rewarded for being “**green**”?

Renewable Energy Guarantees of Origin (REGOs) could be one source of income

- REGOs are an **indicator of the “greenness”** of electricity
 - **Certify** the origin of electricity (generation technology, location, age ...)
 - Transparency: signal to **end-consumers**, tracking ensures credibility
 - **(Potential) source of revenue** for producers
 - **Voluntary**: no obligation to collect or buy REGOs
- Retailers purchase REGOs to offer 100% green tariffs to meet consumer demand

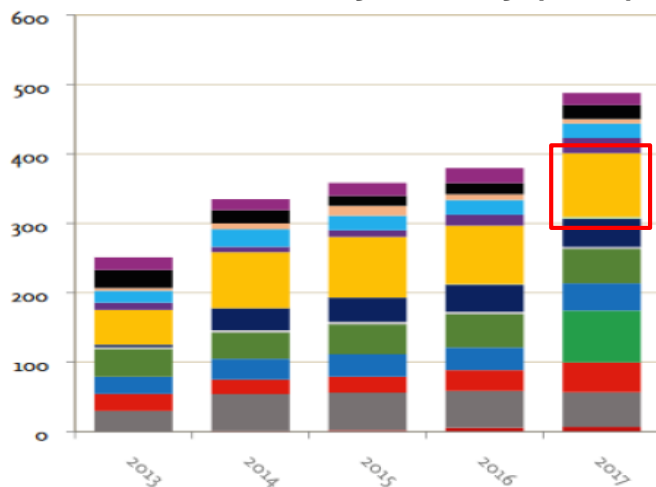


Source: RECCS International

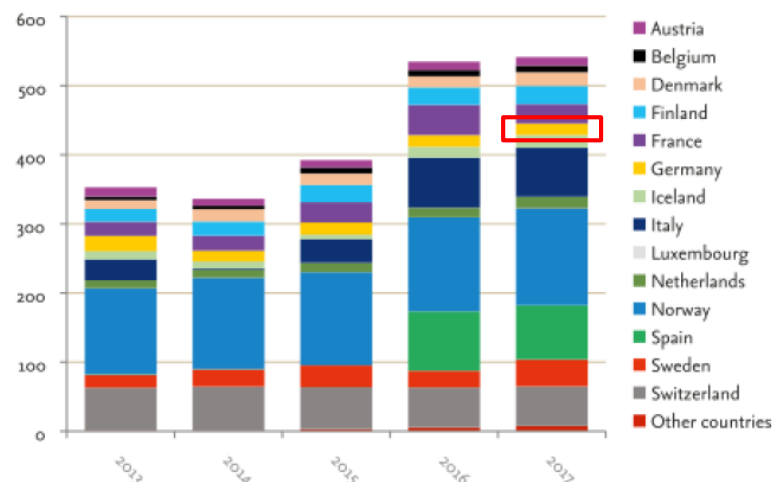
Most German consumers do not purchase local green energy, but rather foreign REGOs

- “Doppelvermarktungsverbot”: to **prevent double trading**, plants benefiting from EEG are not eligible for REGOs
- 2018: REGOs for c. 100 TWh cancelled in Germany
 - In 2018, net power consumption in Germany was c. 527 TWh, REGOs produced in Germany were 18.8 TWh
- Most 100% green tariffs offered in Germany rely on **foreign REGOs** – rather than local generation

Cancelled REGOs by country (TWh)



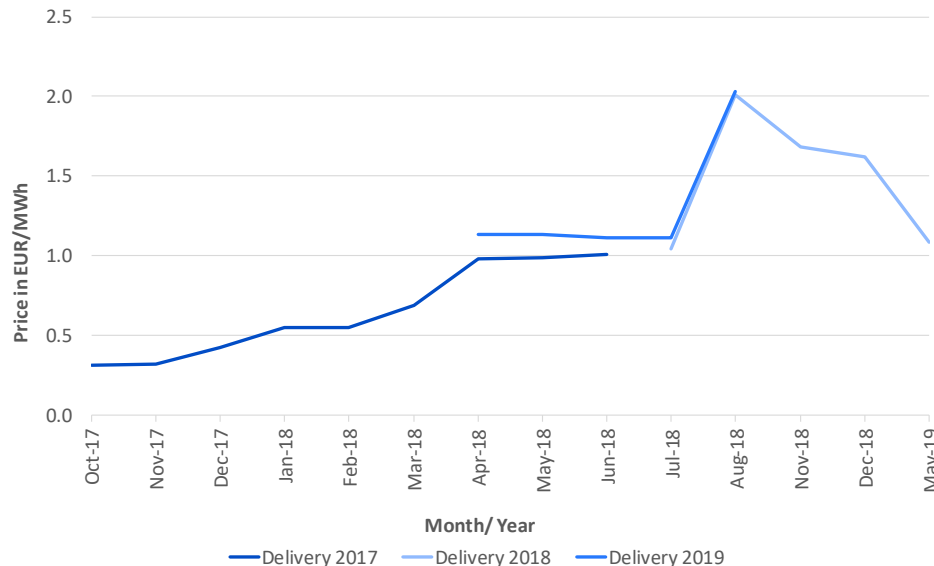
Issued REGOs by country (TWh)



European REGOs are cheap and thus not a reliable source of income for renewables projects

- Price of REGOs is **low**
 - Does not reflect the cost of new renewables (but rather “windfall” to old and existing hydro)
- The current price for “greenness” of electricity is c. **1.5 €/ MWh**
 - Av. EU power prices: household customers: c.220 €/ MWh; wholesale market: 47 €/ MWh
- **Differentiation** by plant age, location and technology does not lead to much higher prices
- E.g. on average, green household tariffs are **no more expensive** than grey ones in Germany¹

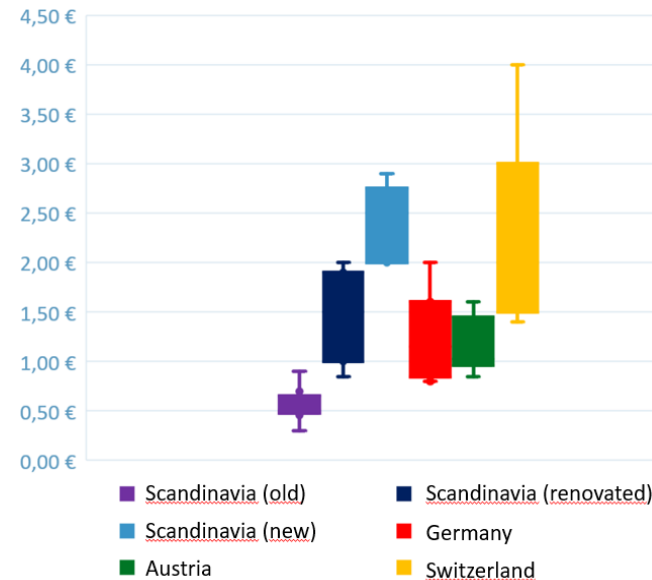
REGO prices are relatively low



Source: NERA analysis based on data provided by Advantag Aktiengesellschaft

¹ BNetzA Monitoring Report 2018 (p. 263, 289)

Prices vary for different types of REGOs

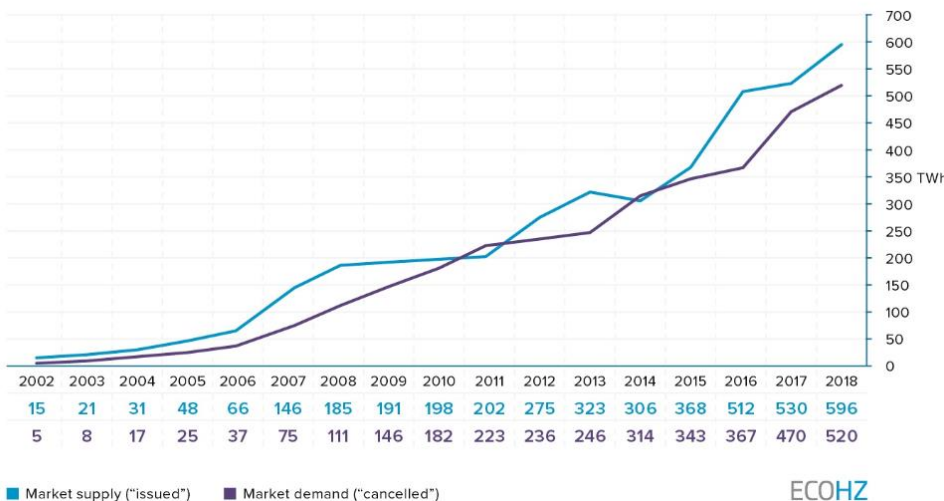


Source: Umweltbundesamt

Low prices in the common European market result from oversupply – will increased demand change the dynamics? (1)

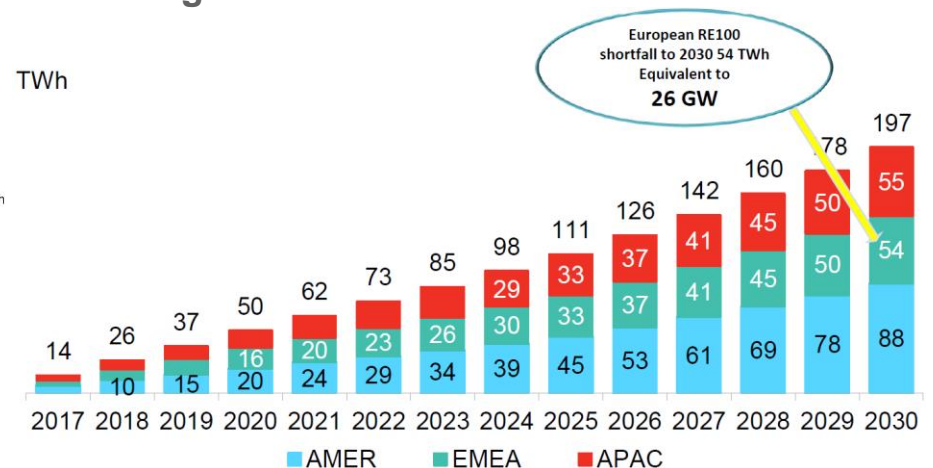
- Demand side driven by consumers' **willingness to voluntarily pay** for “greenness”
 - May be increasing as RE commitments become more common among (corporate) consumers
- **Oversupply** of REGOs has so far kept prices low
 - Oversupply results from issuance of REGOs to old hydro plants that are competitive without subsidies who treat REGOs as windfall

Supply of REGOs exceeds demand



Source: ECOHZ
© NERA Economic Consulting

Corporate commitments to 100% renewables are increasing



Source: Werner, Robert. 2019. “Chancen und Grenzen von green PPA als Treiber der (deutschen) Energiewende.” Strommarkttreffen 18.01.2019.

Will the price increase if companies turn “green”? (2)

The market is likely to remain oversupplied for the foreseeable future

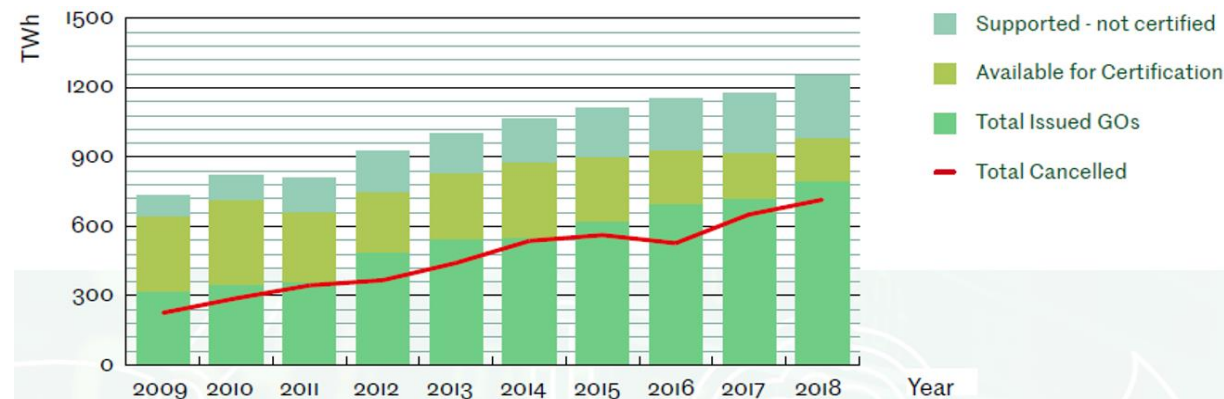
- **Supply** will continue to **increase**

- i) reserve of uncollected REGOs (c. 200 TWh in 2018)
- ii) plants drop out of subsidy schemes
- iii) promotion of non-subsidized green generation capacity

- **Demand increases**

- But the additional reserve of REGOs alone appears to be sufficient to cover the increase in (pledged) corporate demand for renewable energy

REGO generation and available reserves for certification compared to total renewable generation (Europe)

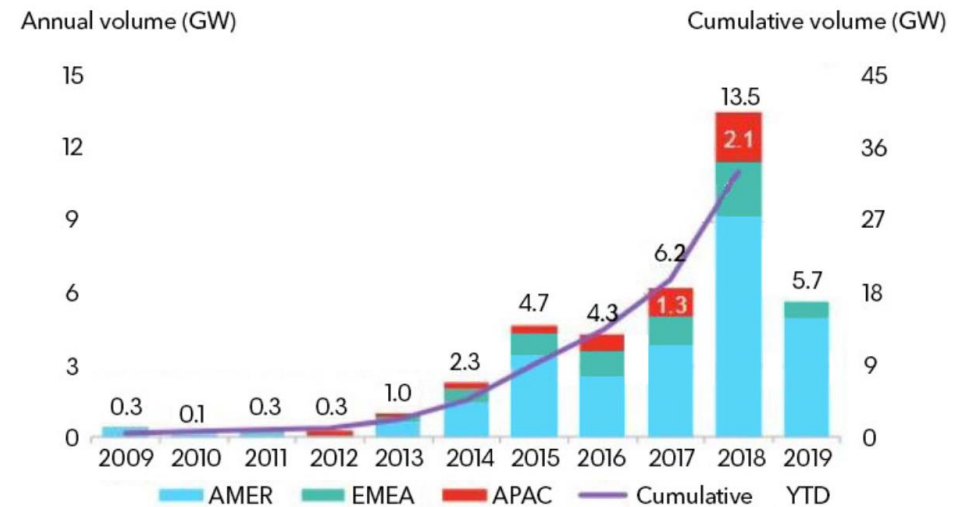


Source: RECS International (2019): 2018 Annual Report

Is the US different? US REGOs (“voluntary RECs”) are an important instrument to create green tariffs and PPAs

- Variety of mechanisms used to promote green electricity across states
- REGO-based models traditionally important
 - Constituted 26% of green power sales in 2017²
- Renewable power purchase agreements (PPA) are a major factor in the US
 - REGOs central element – sold together with the power delivered
- Strong links between REGO and *mandatory* REC prices: Choice between selling RECs on the mandatory or voluntary market

Global corporate PPA volumes, by region



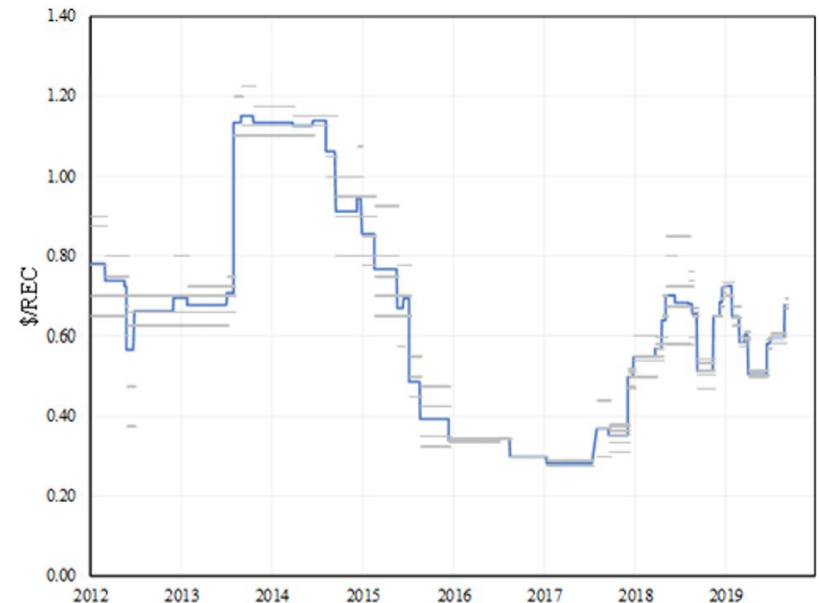
Source: Bloomberg New Energy Finance. Data is through 2018

² Excluding large hydropower

US REGOs are cheap as well and hence are not a reliable source of income for plant operators

- Traded OTC on a nationwide market
- REGO production from new plants is relatively cheap due to
 - i) tax credits
 - ii) mandatory RECs being oversupplied
- Oversupply of REGOs
 - Rapid increase of unbundled REGOs due to tax-break induced competitiveness
 - Spill-overs from oversupplied mandatory REC markets
- Since 2017, (corporate) consumers increasingly demand renewable energy
- Consumers not necessarily demand the green electricity to have specific characteristics

US REGO prices are low



Source: NERA Analyses using Marex Spectron data

What would increase the value of “greenness”?

- Investors need to consider (higher) REGO-prices to be **stable sources of revenue**
 - Ex. Spain: renewable projects received funding by integrating REGOs into PPAs as REGOs were considered as providing cash flow by the financing agent ³
- Focus on promoting REGOs from **“new”/ additional plants**
 - REGOs so far do not directly incentivize construction of new RE facilities
 - 2017: only 5% of European REGOs were issued to new plants
- Revision of **rules for issuing/ acceptance** of REGOs
 - Ex: Green electricity labels no longer accept REGOs from non-interconnected markets (e.g. Iceland)
- But without **cheap REGOs**, corporate consumers face challenges to comply with their renewable energy goals (e.g. RE100 goals)
 - End-user willingness to pay shown to be limited in various studies
- For a given level of public demand for renewables the voluntary nature of additional corporate/ private demand means (public) pressure to use RE influences WTP and thus the price

³ See: Perez, Mario. 2019. “As demand for “green” power soars, utilities turn to Guarantees of Origin”. S&P Global Platts Insight (<https://blogs.platts.com/2019/08/07/eu-green-electricity-guarantees-of-origin/>)

| About Us

Your Speakers



Dominik Huebler

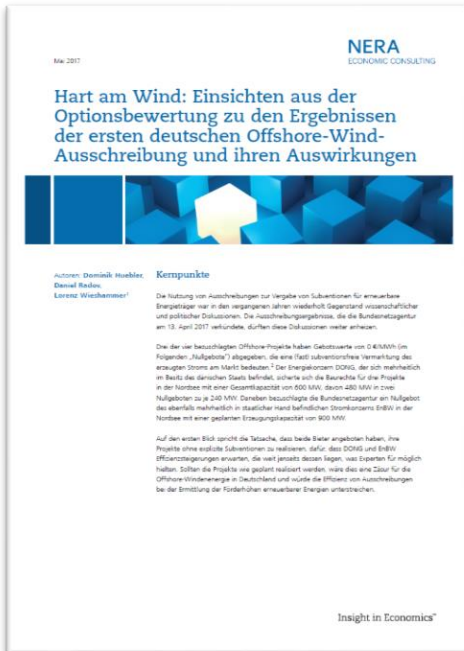
- Associate Director in the Energy, Environment, Communications & Infrastructure Practice in Berlin
- 12 years of experience in consulting for infrastructure companies, investors, law firms and public institutions, e.g.:
 - Advice on instruments promoting renewable energy sources in Europe and the US, including renewable energy credits
 - Regulatory and market due diligence for off-shore wind projects, cogeneration and regulated networks in Germany and Europe
 - Advice on economic questions regarding the German Renewable Energy Act (EEG) and Combined Heat and Power Act (KWK-G) for different clients
 - Several publications in energy economics, e.g., on §24 Renewable Energy Act (reduction of the support in the case of negative prices), changes to renewable energy support schemes, financing costs, evaluation of incentive regulation, etc.



Leonie Janisch

- Research Officer in the Energy, Environment, Communications & Infrastructure Practice in Berlin
- Experience in consulting for energy companies and law firms e.g.:
 - Analysis of instruments promoting renewable energy sources in Europe and the US, including renewable energy credits
 - Arbitration support for price adjustments under long-term gas supply
 - Analyses of risks and opportunities in regulated network industries in Europe

Want to know more? - NERA experts have published widely on the topic



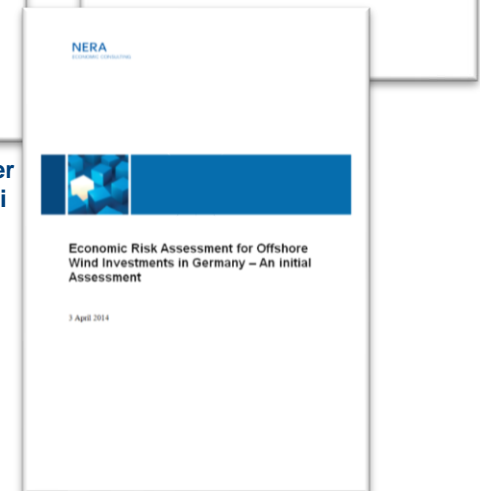
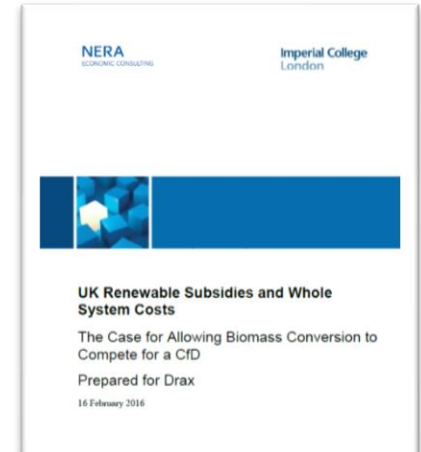
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<https://www.strommarkttreffen.org/2019-04-12-Huebler-Arndt-PPA-als-Joker-in-EE-Ausschreibungen.pdf>





Thank you for your attention!

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