

Where is renewable energy innovation heading? – What patents data can tell us

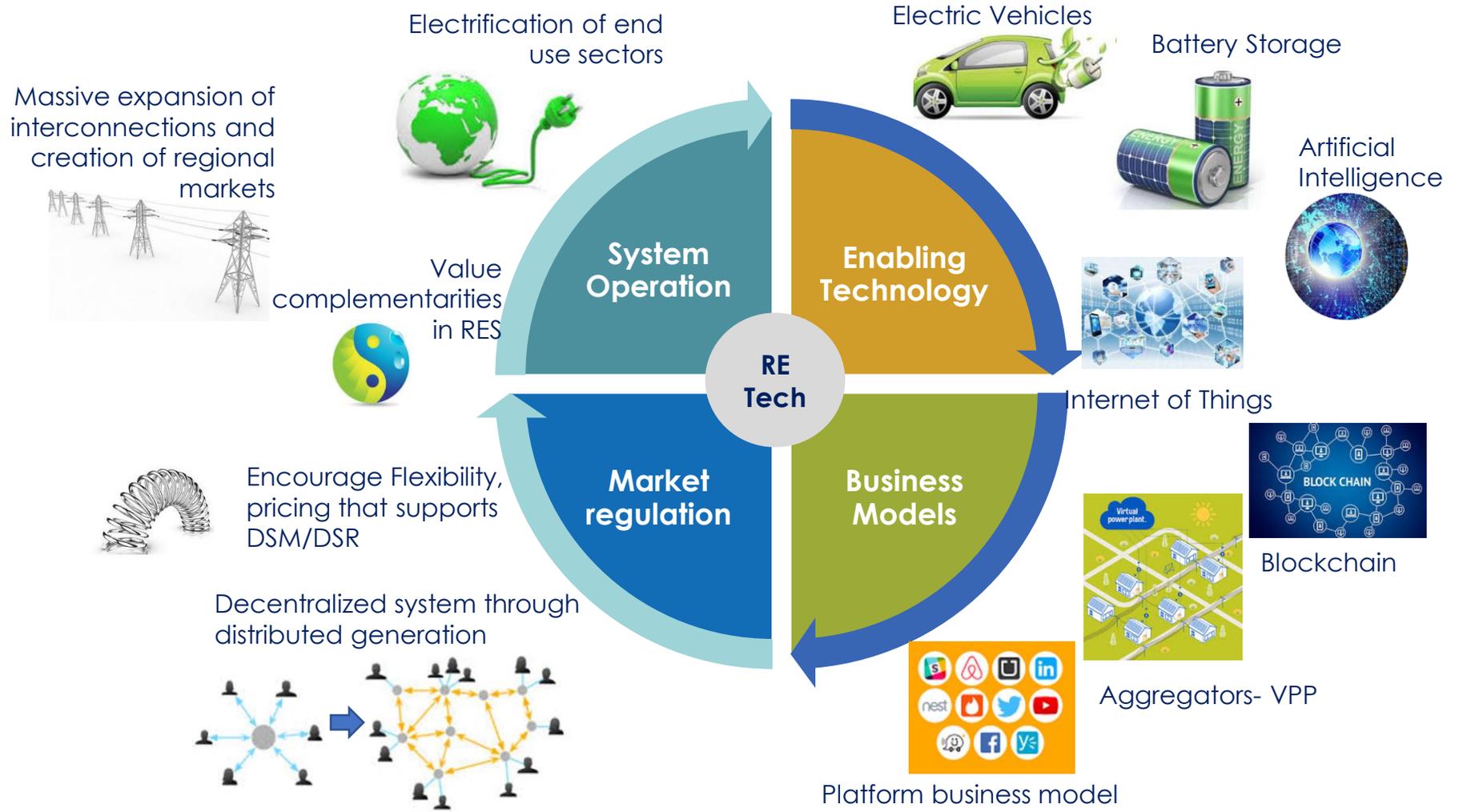
Presenters:

- Alessandra Salgado, Renewable Energy Innovation team |
- Francisco Boshell, Team lead Renewable Energy Technology, Standards and Markets

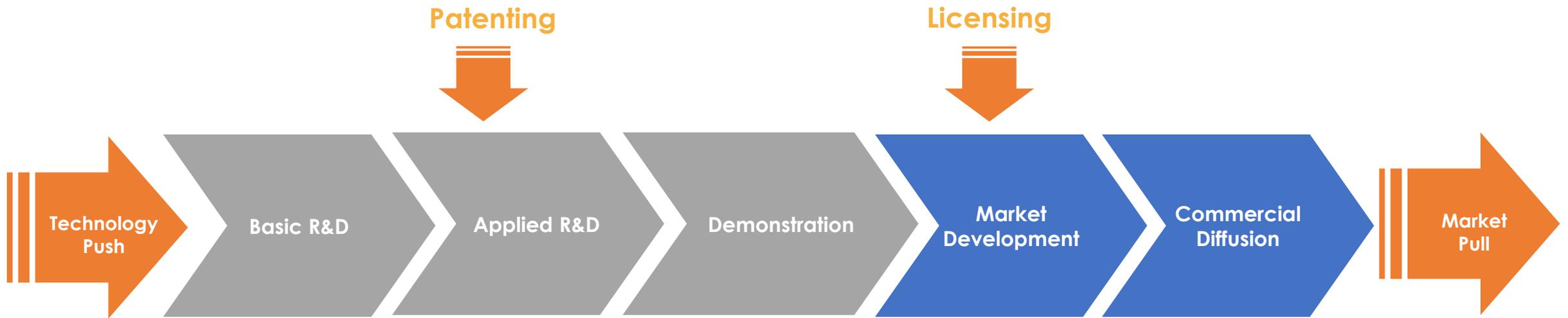
TUESDAY, 4 FEBRUARY 2020 • 10:00 – 10:30 CET

Many innovations emerging in the energy transition

What type of indicators do we have to monitor and analyse innovation trends?



Patents as an instrument to monitor innovation efforts



Patents are part of IPRs that can play prominent roles mainly at the technology development and market introduction stages

Publicly Available Interactive Web Tool – “INSPIRE”

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EXPLORE INFORMATION ON PATENTS FOR RENEWABLE ENERGY

Interested in RE patents?

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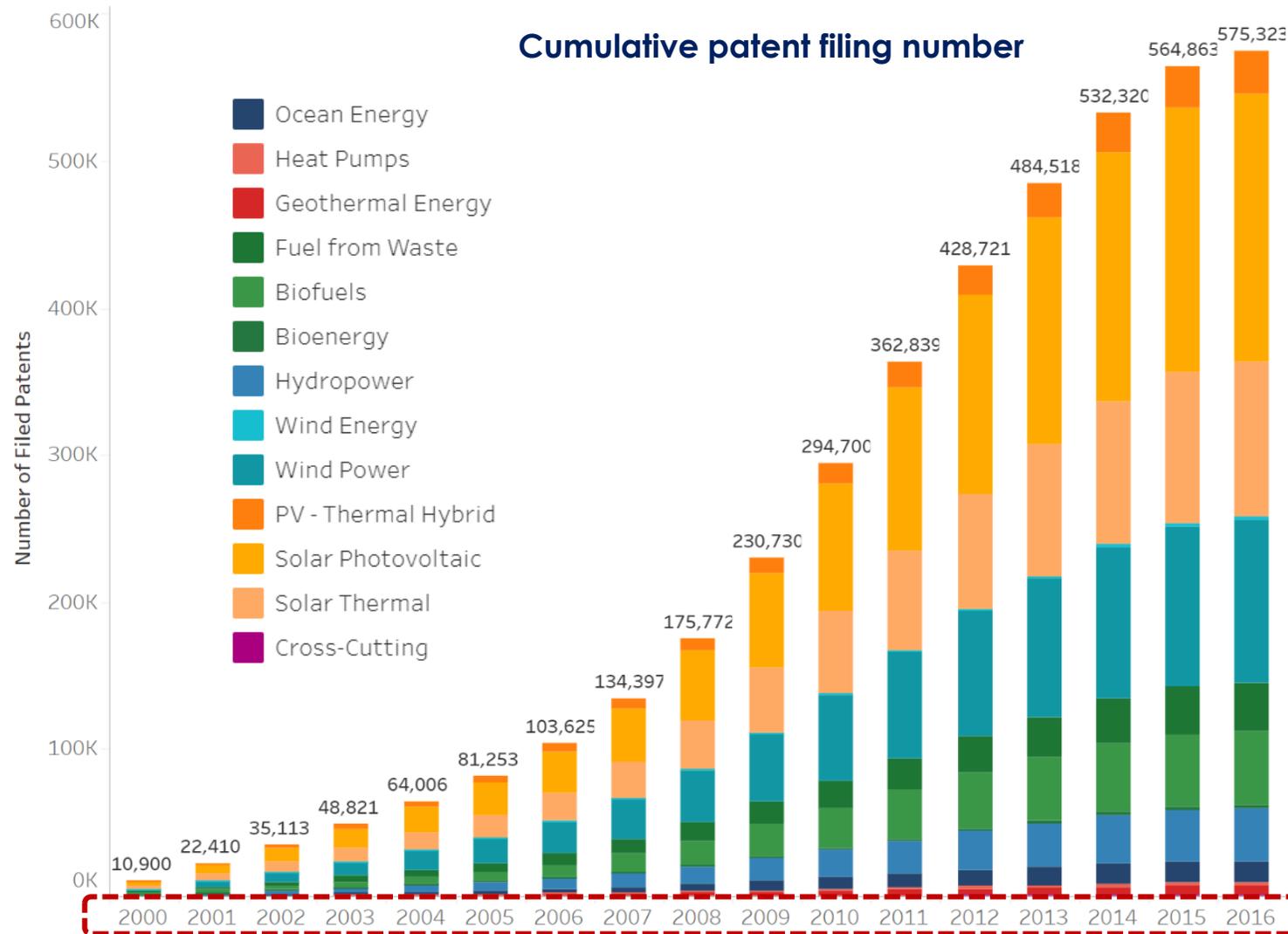


Patent Development in Renewables

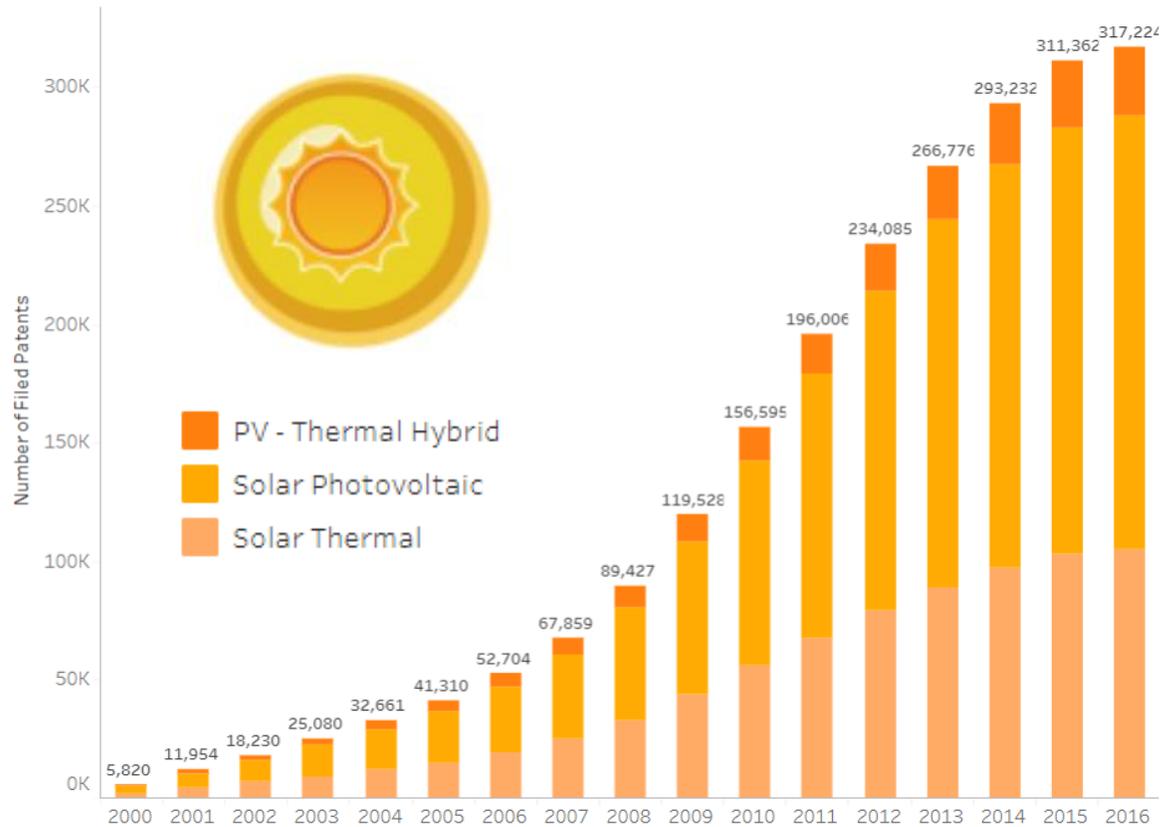
- Close to 600 000 patents in RE by end of 2016
- A compound annual growth rate of 17% between 2006 and 2016
- Solar, Wind and Bioenergy accounts for 90% of the patents in renewable Energy in 2016
- Solar is the leading technology with 55% of patents in 2016
- All the renewable energy technologies have at least tripled the quantity of patents in comparison to 2006



Patents Evolution of Renewable Energy Technologies

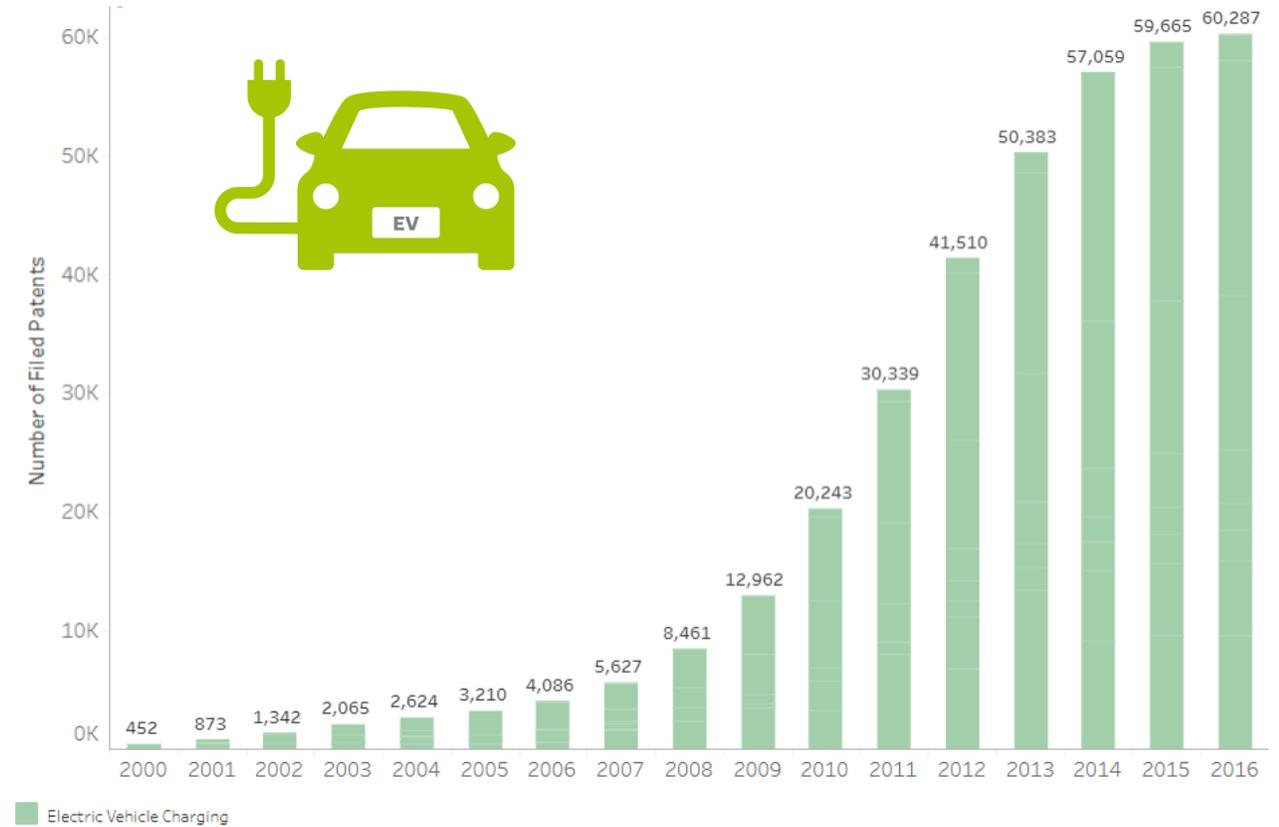


Patents in Renewable Energy



✓ Solar : **6 fold growth** in last 10 years

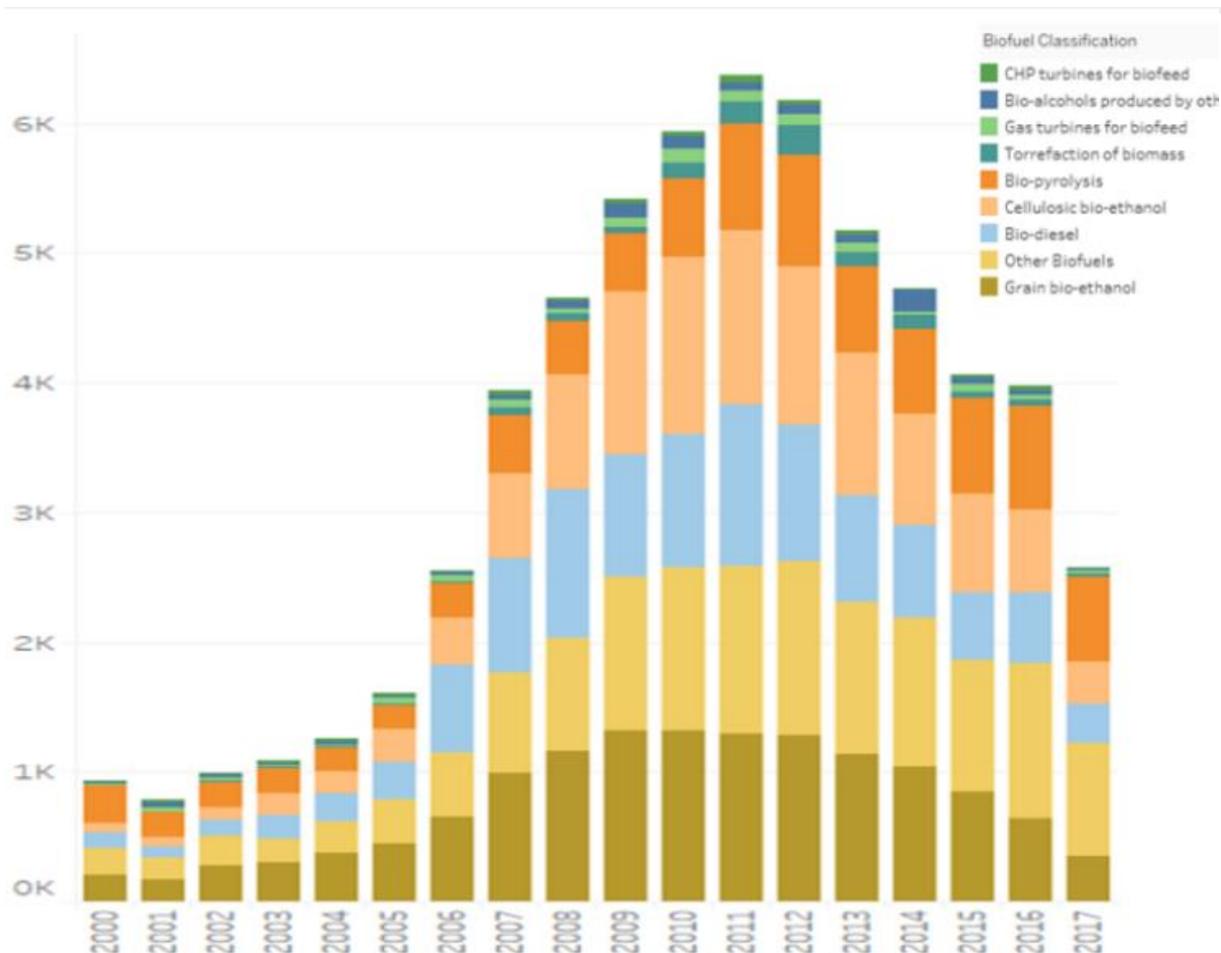
Patents in Enabling Technologies-Transport Sector



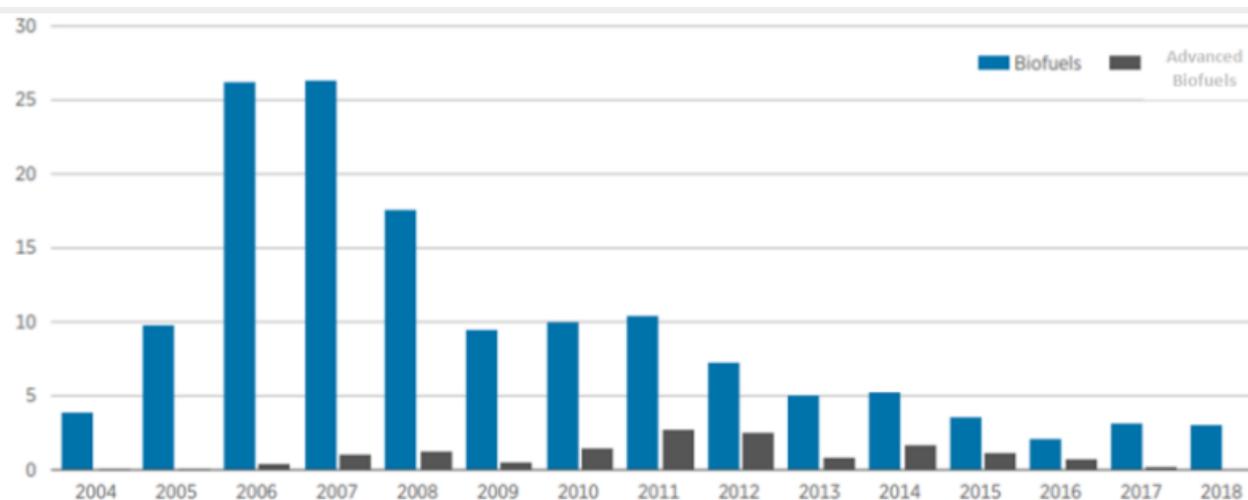
✓ EV Charging : **16 fold growth** in last 10 years

Example - Patent filing in liquid biofuels

Annual filing of patent liquid biofuels



Annual investments in liquid biofuels



Top patent applicants in liquid biofuels

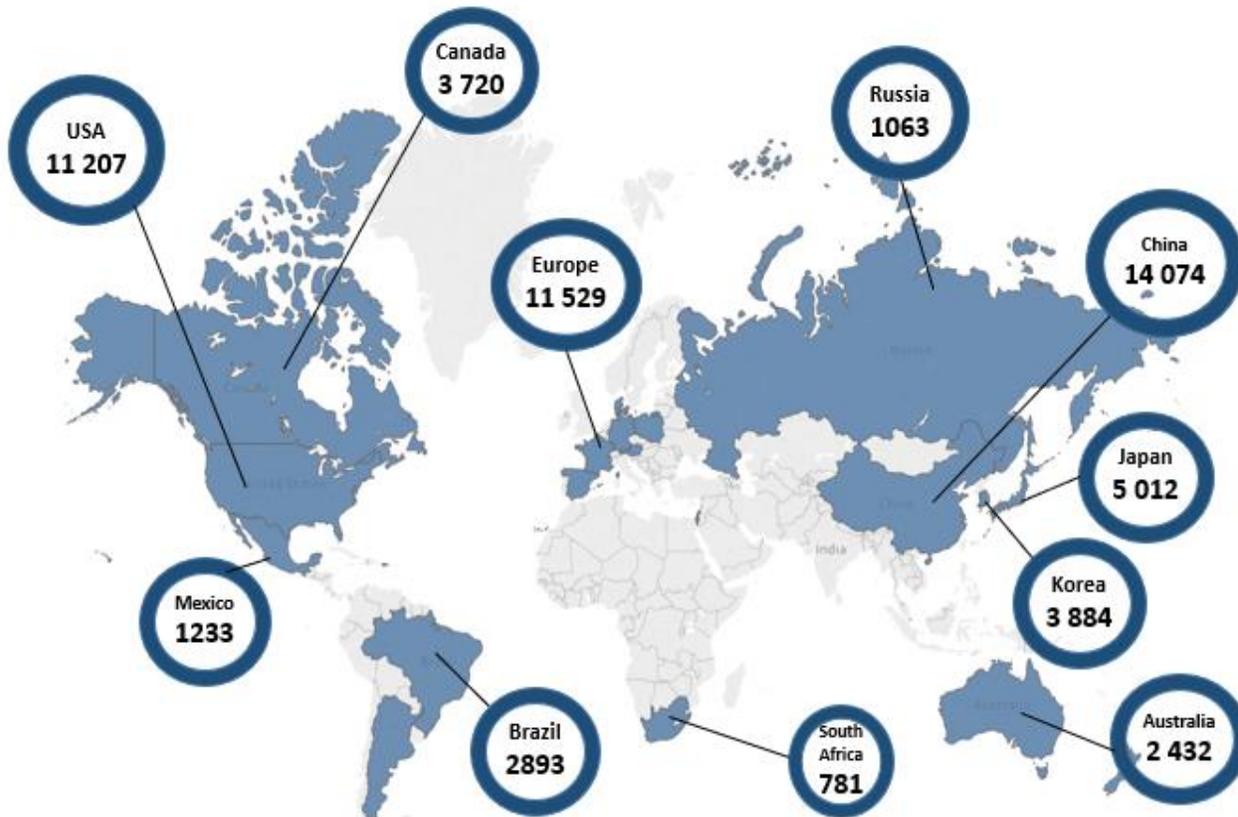
Top 10 Applicants

The following persons or organisations have filed the most patents in the selected timeframe:

Applicant	Patent filings
Xyleco, Inc.	547
Medoff, Marshall	464
Novozymes A/S	460

Innovation and production do not always occur in the same place - the case of liquid biofuels

Patents (2000-2017)



Production 2017 (Billion Litres)



Interesting cases

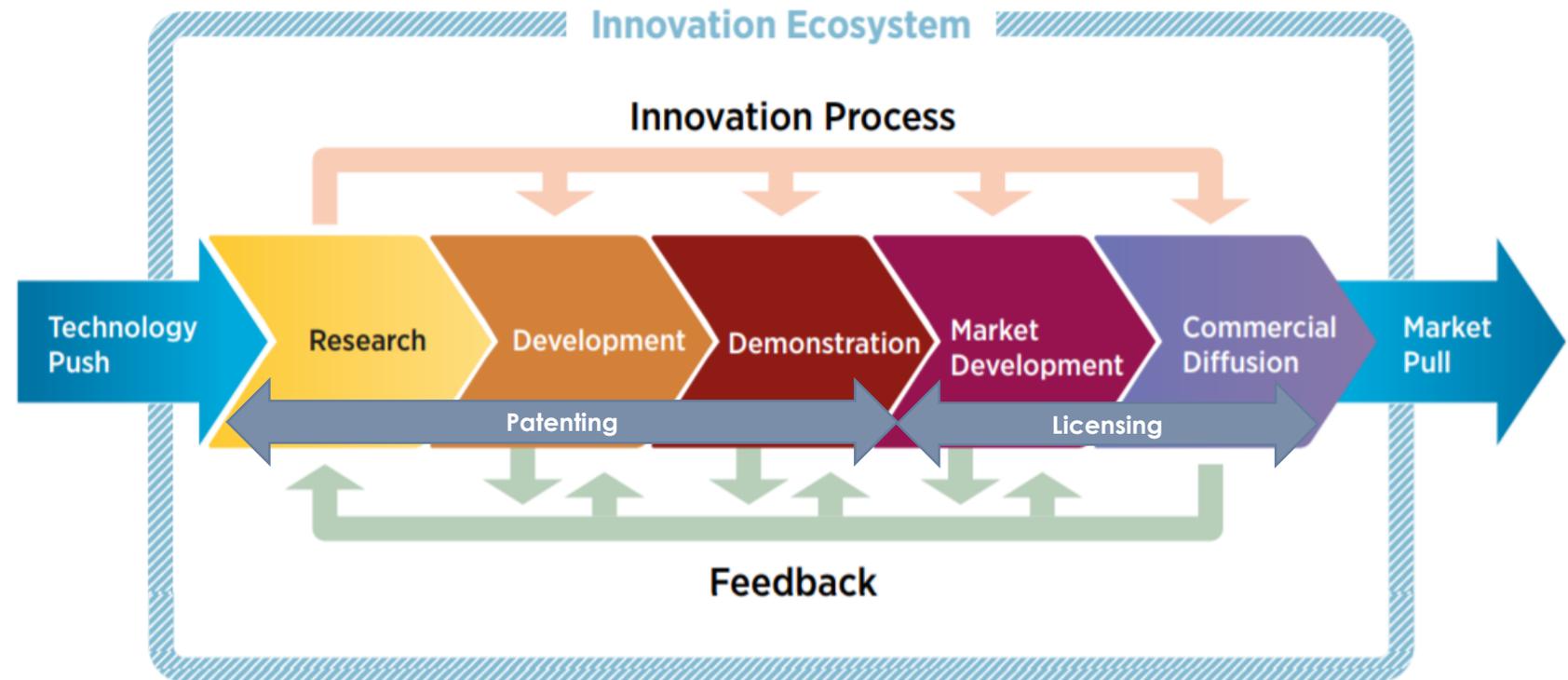
- Japan, Korea, Australia and Mexico
- Thailand and Indonesia

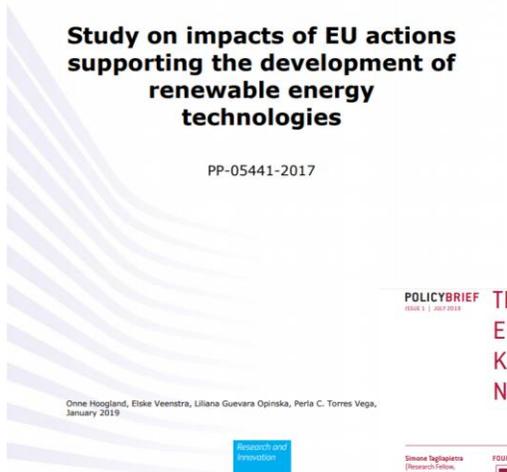
*Note: Cumulative filed patents, period is 2000-2017. Biofuels productions includes bio-ethanol, bio-diesel and bio-jet. Europe refers to EU-28.
Disclaimer: Boundaries and names shown on this map do not imply any official endorsement or acceptance by IRENA.
Source for Biofuels production: International Energy Agency*

Takeaways - Patent data is valuable to monitor and foster innovation in renewables

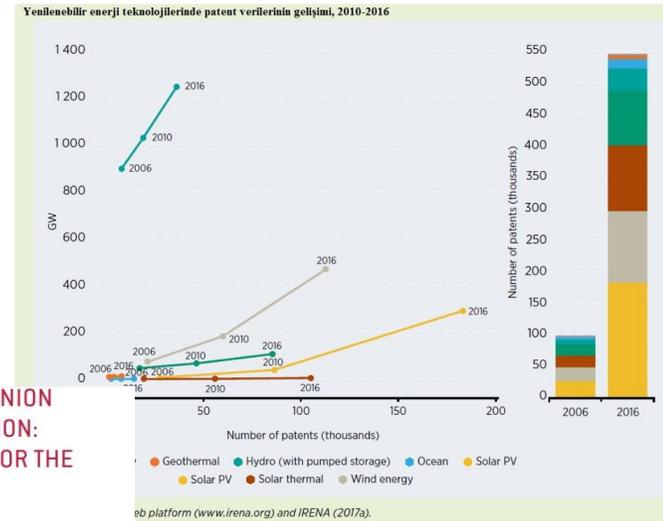
Facilitating access and sharing patent data in a user friendly manner can provide useful information to decision-makers on:

- ❖ Evidence on trends for technology developments
- ❖ International research and co-operation as indicated by co-invention
- ❖ Which countries and innovators are active
- ❖ Which countries are potential markets





2006'dan bu yana yenilenebilir enerji kaynakları arasında en hızlı patent artışı kaydeden Solar PV, 2016 yılında tüm yenilenebilir enerji teknolojileri arasında en büyük paya sahip oldu. Solar PV ve güneş enerjisi teknolojileri birlikte 2016'daki patentlerin yarısından fazlasını oluşturuyor. Rüzgar patentleri toplamın beşte birini, biyoenerji ise altıda birini oluşturuyor. Bunları hidroelektrik ve diğerleri takip ediyor.



POLICY BRIEF
ISSUE 1 | JULY 2018

THE EUROPEAN UNION ENERGY TRANSITION: KEY PRIORITIES FOR THE NEXT FIVE YEARS

FOUR PRIORITIES UP TO 2024 TO FOSTER THE EU ENERGY TRANSITION

- Priority 1: Adapt infrastructure policies to decarbonise the transport sector
- Priority 2: Get the electricity system ready for a substantial increase of renewables
- Priority 3: Strengthen the EU component standards in low-carbon technologies
- Priority 4: Foster decarbonisation in industry and buildings

THE ISSUE
Over the last decade, the European Union has pursued a proactive climate policy and has integrated a significant amount of renewable technologies - such as solar and wind - into the established energy system. These efforts have proved successful and continuing along this pathway, increasing renewables and improving energy efficiency would not require substantial policy shifts. But the EU now needs a much deeper energy transition to (i) decarbonise in line with the Paris agreement, (ii) seize the economic and industrial opportunities offered by this global transformation, and (iii) develop an EU approach to energy competitiveness and security, as the EU has neither the United States' shale potential nor China's top-down investment possibilities.

POLICY CHALLENGE
A full-fledged energy transition is becoming economically and technically feasible, with most of the necessary technologies now available and technology costs declining. The cost of the transition would be similar to that of maintaining the existing system, if appropriate policies and regulations are put in place. In short, the EU could benefit from deep decarbonisation irrespective of what other economies around the world do. The transition can also be socially acceptable, if the right policies are put in place to control and mitigate the distributional effects of deeper decarbonisation. The time to act is now, because energy is a rigid system in which infrastructure and regulatory changes take a decade to be fully implemented, while competition is not deepening - as Chinese solar panels and the rise of the electric vehicles industry clearly show. Policy choices made up to 2024 will define the shape of the EU energy system by 2050.

The authors would like to thank Lucien Vanc, Chief Economist of the International Energy Agency, for ideas and comments.

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Associations/Institutes

- ✓ Institute for Advanced Sustainability Studies e.V. (IASS)
- ✓ Association for the Protection of Intellectual Property (AIPPI)

Overview: IRENA Innovation Work



Reports in innovation:
energy transition, policy,
IP, RD&D cooperation
mechanisms

Innovation Outlooks
Forthcoming :Thermal Storage



Innovation Landscape
for the Power Sector
Transformation

Interactive dashboards displaying RE
patent data Ongoing update- will
expand classifications



IRENA Technology Briefs





2016



2018



IRENA
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Save-the-date | IRENA Innovation Week 2020 |
8-10 September 2020 | Bonn, Germany

innovationweek@irena.org

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Questions & Answers

Please use the 'Questions' feature on the webinar panel

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☐ TUESDAY, 21 February 2020 • 10:00 – 10:30 CET

“Grid Stability with High Share of Renewables - Transforming Small Island Power Systems”

☐ TUESDAY, 3 March 2020 • 10:00 – 10:30 CET

“Planning for the renewable future: improving use and development of long-term energy scenarios”

Thank you!

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