

INSPIRE: IRENA's Platform on Patent Data and International Standards for Renewables

Presenter:

- **Francesco Pasimeni**, Innovation Team, IRENA

TUESDAY 8 MARCH 2022 • 14:00-14:30 CET

SPEAKER

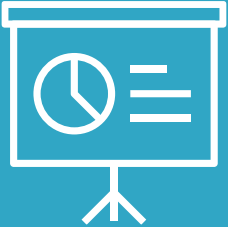


Francesco Pasimeni

Associate Programme Officer
Innovation Team, Standards and Patents
IRENA

IRENA insights

WEBINAR SERIES



We need fast development, deployment and diffusion of **Renewable Energy Technologies (RETs)**

(Inter)National initiatives are needed to **boost technological innovation** and accelerate the transition

Monitoring progress RETs

- Evaluate the status of the global energy transition
- Assess link between environmental targets and RETs
- Indicate international market in the area of RETs
- Policy leverage for amendment of existing targets

Standard and Patent data

- Provide insights on the technological progress
- Detect global trends in the development of RETs
- Give quanti/qualitative information of layers in the innovation process of RETs

INternational

Standards

and

Patents

In

Renewable

Energy



Interactive online data platform which offers information on international standards and patents related to RETs

Free access web tool developed to **monitor the innovation trends**, front-runner countries, and leading technology organizations in RETs using standards and patents data analytics

It offers metrics useful to be translated into valuable **insights for policymakers**, entrepreneurs, industry, research bodies and other key stakeholders in the energy sector.

- 1 Standards + INSPIRE**
- 2 Patent + INSPIRE**
- 3 New patent indicators + Hydrogen dashboard**
- 4 Technology Innovation Mapping: Offshore wind**

International Standards

Documents that emerge from **internationally harmonized requirements** for the development of a reliable and effective design, production and use of technologies

International technical standard

- Developed based on **consensus among experts** and approved by some **recognized bodies** (ISO, IEC, etc.)
- Increase the level of technology **quality** and **safety**
- Increase consumers' **confidence** and **acceptance** in technologies
- Reduce/overcome market barriers enabling **technological transfer**
- Ease international co-operation, tradability and **compatibility** with foreign technologies
- Support **innovation** and **diffusion**: state-of-the-art, best available knowledge, interoperability
- **Voluntary, but** technical regulation based on standards may be **compulsory**
Public/financial incentives require adoption to or compliance with standards

Standards as **indicator** of:

- Indirect sign of technology **progress**
- Technology **readiness** and the stage of commercialization
- **Deployment** of innovative technologies

SETP 1: data collection

Data extracted from publicly available resources, such as main international standardization bodies:



International Organization for Standardization



International Electrotechnical Commission



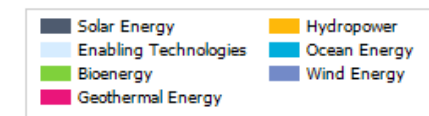
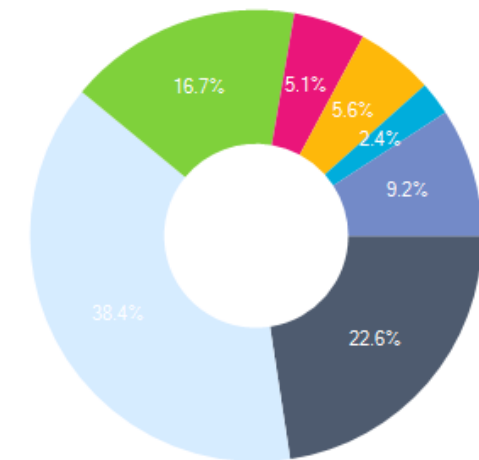
European Committee for Standardization

SETP 2: data handling

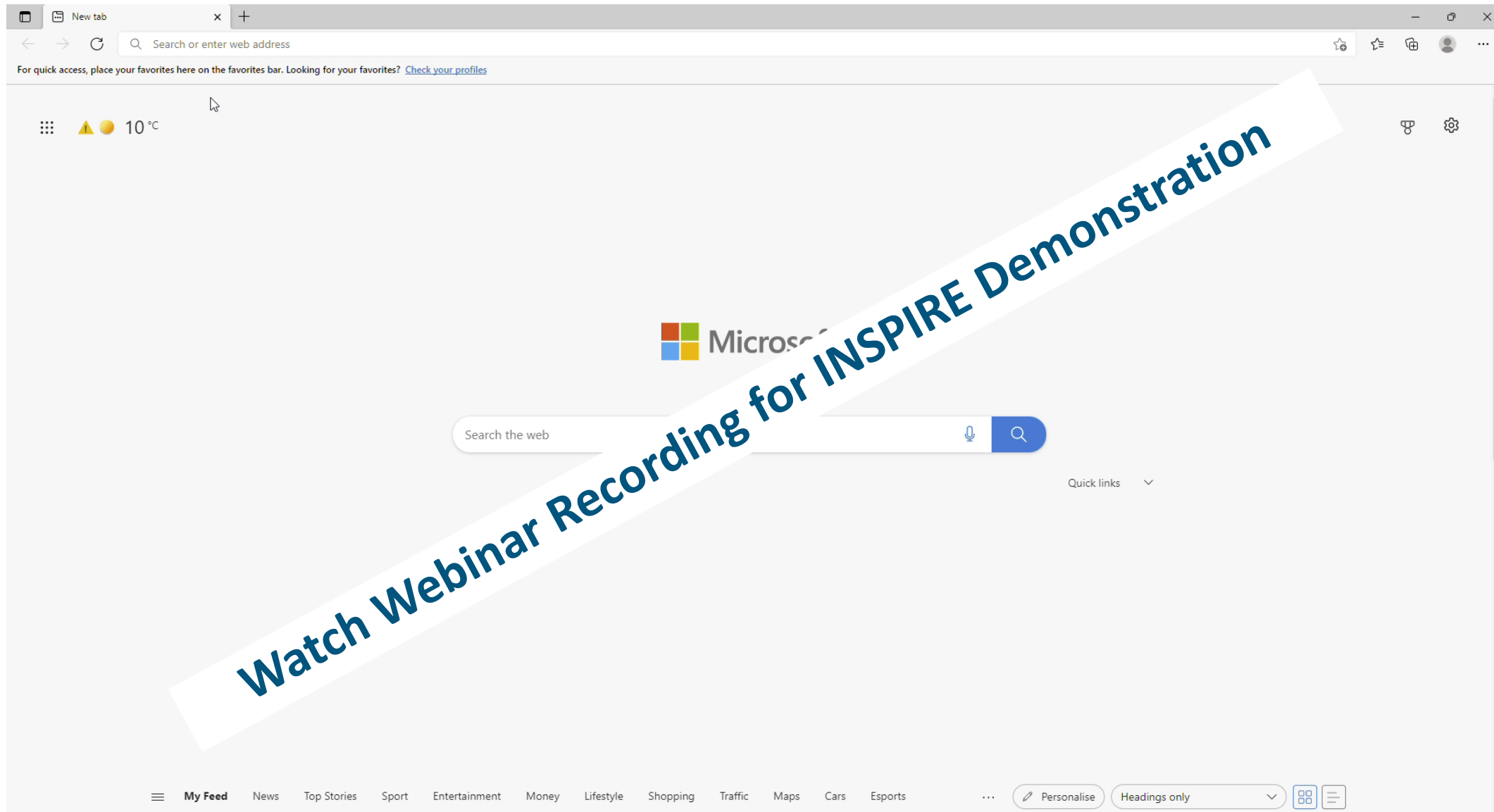
Knowledge-intensive categorization of relevant standards

- ✓ Title
- ✓ Abstract
- ✓ Body
- ✓ Publication date
- ✓ Normative references
- ✓ Technology
- ✓ Technology sub-level
- ✓ Aspect covered

SETP 3: data visualization



INSPIRE: Standards



Patents

Legal title that grants to its holder the **right** to **prevent** others from **exploiting** an **invention** for commercial purposes, without authorization

- Valid in a **given jurisdiction** for a **limited time** (usually 20 years)
- Granted for inventions that are new and bring an inventive step concerning **industrial applications**
- Valuable **assets** for organizations (market opportunities, competition and technology development)

Patent data:

- Give detailed **bibliographic information** on the inventions produced
- Monitor the **technology development** on a global scale
- Provide an objective and evidence-based overview of the status of **global inventiveness**
- Compare **technological progress** between countries, sectors and their evolution over time
- Provide insights on countries and companies' **strategies** and on the level of international collaboration

SETP 1: data collection

Data extracted from PATSTAT: worldwide patent statistical database created and maintained by the European Patent Office (EPO)



- ✓ Patent applications
- ✓ National jurisdictions
- ✓ Filing date
- ✓ Technology classification

SETP 2: data handling

Technology classification of patent data based on Cooperative Patent Classification

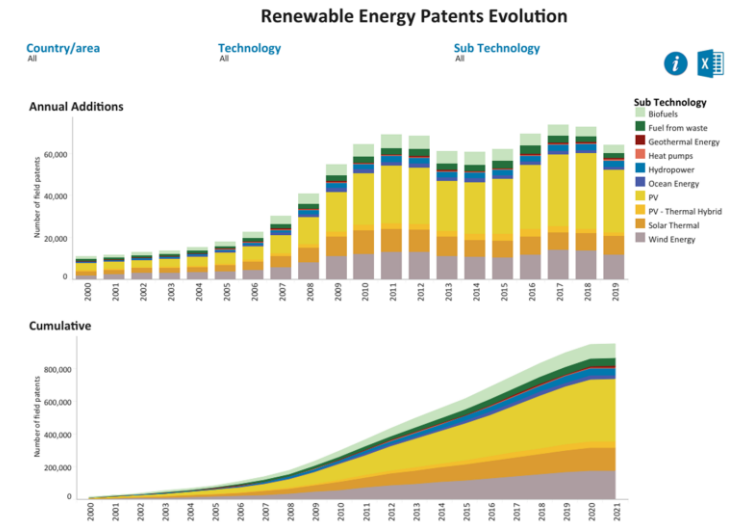


Y02 patent classes

Technologies or applications for mitigation or adaptation against climate change

<input checked="" type="checkbox"/>	Y02E 10/00	Energy generation through renewable energy sources
<input checked="" type="checkbox"/>	Y02E 10/70	• Wind energy
<input checked="" type="checkbox"/>	Y02E 10/72	•• Wind turbines with rotation axis in wind direction
<input checked="" type="checkbox"/>	Y02E 10/727	•• Offshore wind turbines
<input checked="" type="checkbox"/>	Y02E 10/728	•• Onshore wind turbines
<input checked="" type="checkbox"/>	Y02E 10/74	•• Wind turbines with rotation axis perpendicular to the wind direction
<input checked="" type="checkbox"/>	Y02E 10/76	•• Power conversion electric or electronic aspects

SETP 3: data visualization





HOME PATENTS ▾ STANDARDS ▾ QUALITY ASSURANCE ▾ CONTACT US



Watch Webinar Recording for INSPIRE Demonstration

COUNTRIES ENGAGED IN INITIAL STANDARDIZATION FOR RENEWABLES

[Learn more](#)

FORM ON PATENT DATA AND TECHNICAL STANDARDS INFORMATION FOR RENEWABLE ENERGY



The International Standards and Patents in Renewable Energy (INSPIRE) is a platform of the International Renewable Energy Agency, designed to provide up-to-date information on standards and patents in renewable energy.

Search through, locate and perform analysis from a database with more than 2 million patents and over 400 international standards.

New patent indicators

Patents: more indicators

Patent family (or inventions)

Set of patent applications protecting the same invention in different countries → proxy of inventive activity

International patent family

Patent applications in a family filed by applicants resident in a country that is different from the jurisdiction where this patent is filed → international flow of inventions

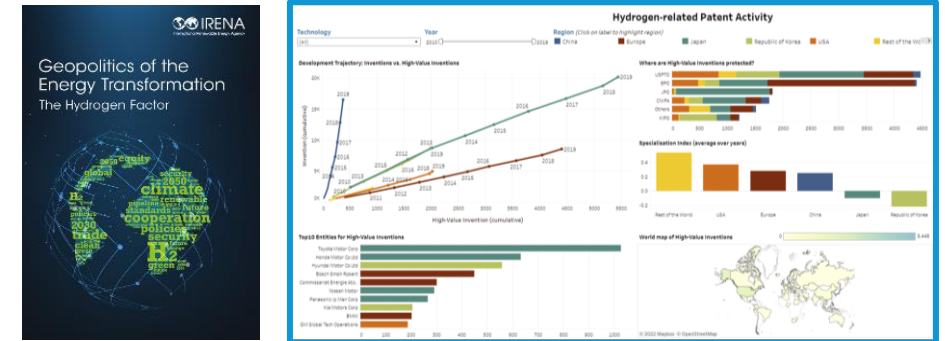
Patent families of high value

Patent families that include patent applications filed in more than one patent office → willingness to spend for IPR and foreseen market value of invention

Specialization index

Country technology invention share in energy sector compared to global share → Patent intensity in technology for a given country compared to global average

Geopolitics of the Energy Transformation: The Hydrogen Factor Hydrogen-related Patent Activity



https://public.tableau.com/app/profile/irena.resource/viz/IRENA_INSPIRE_Hydrogen_Patents/HydrogenTech

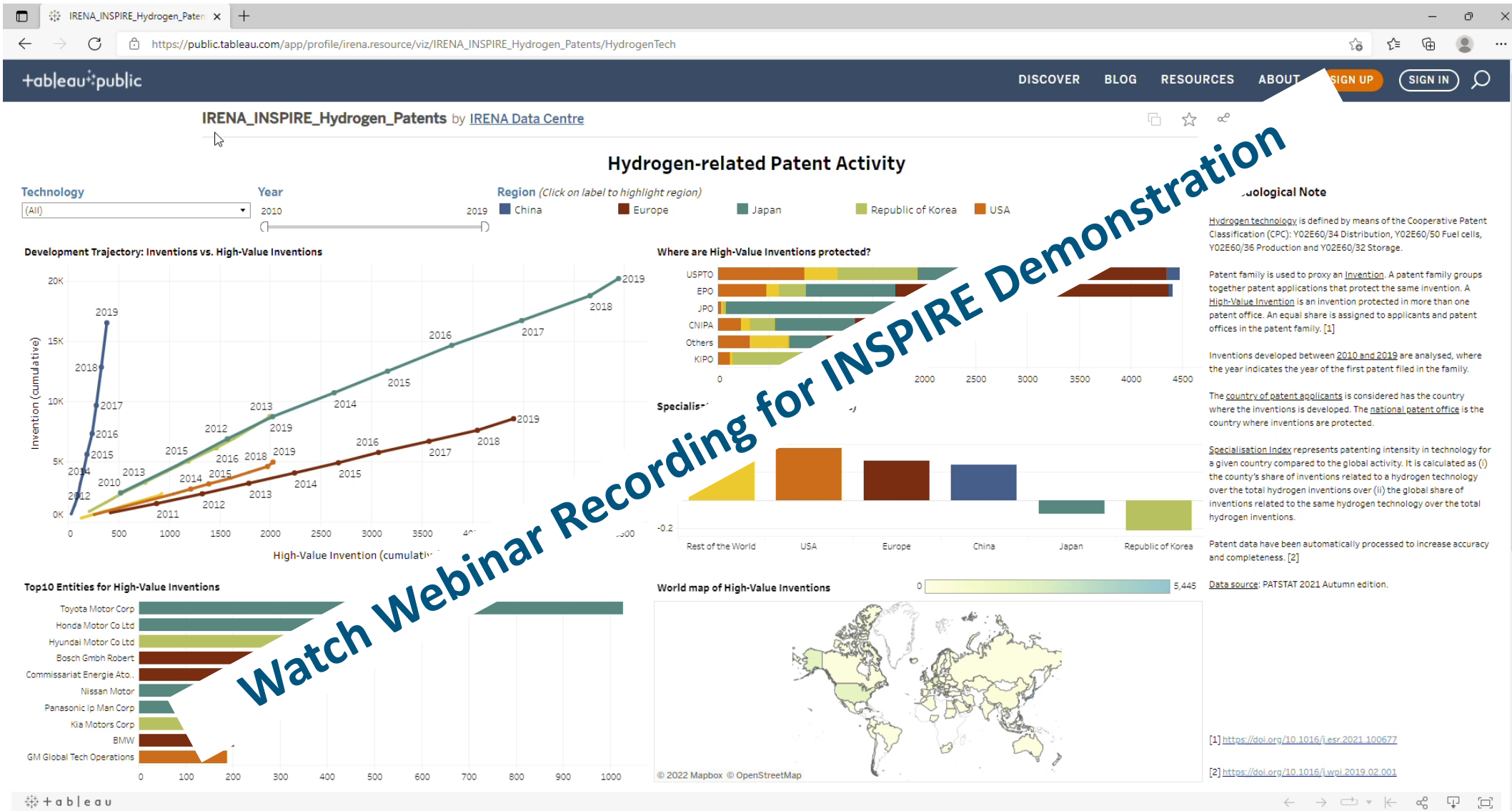
Renewable Technology Innovation Indicators: Mapping progress in costs, patents and standards



Tracking Energy Innovation Impacts Framework (TEIIF) project, funded by the European Commission's Horizon 2020 programme

<https://irena.org/publications/2022/Mar/Renewable-Technology-Innovation-Indicators>

INSPIRE: Hydrogen-related Patent Activity

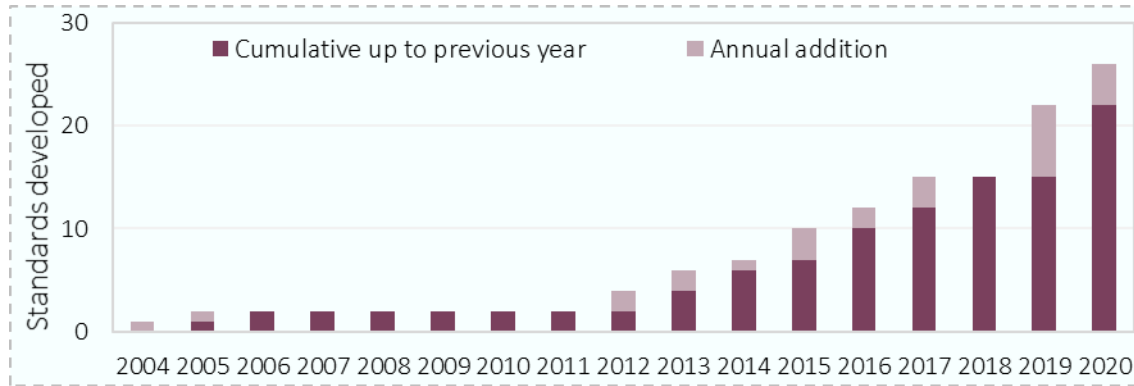


Watch Webinar Recording for INSPIRE Demonstration

Technology Innovation Mapping

Standard & Patent in offshore wind

Standard developed and country participation



2012: first offshore-related standard

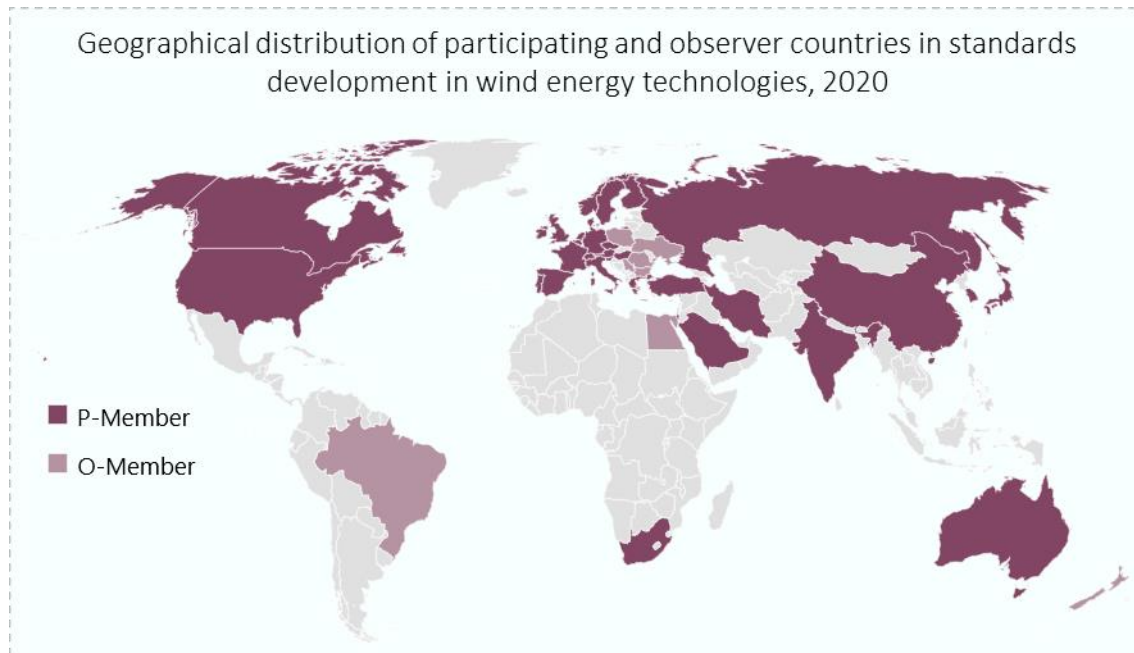
- 33 international standards (2004 to 2020)
- 23 both onshore and offshore
- 5 offshore only or floating wind

Different areas and aspects covered

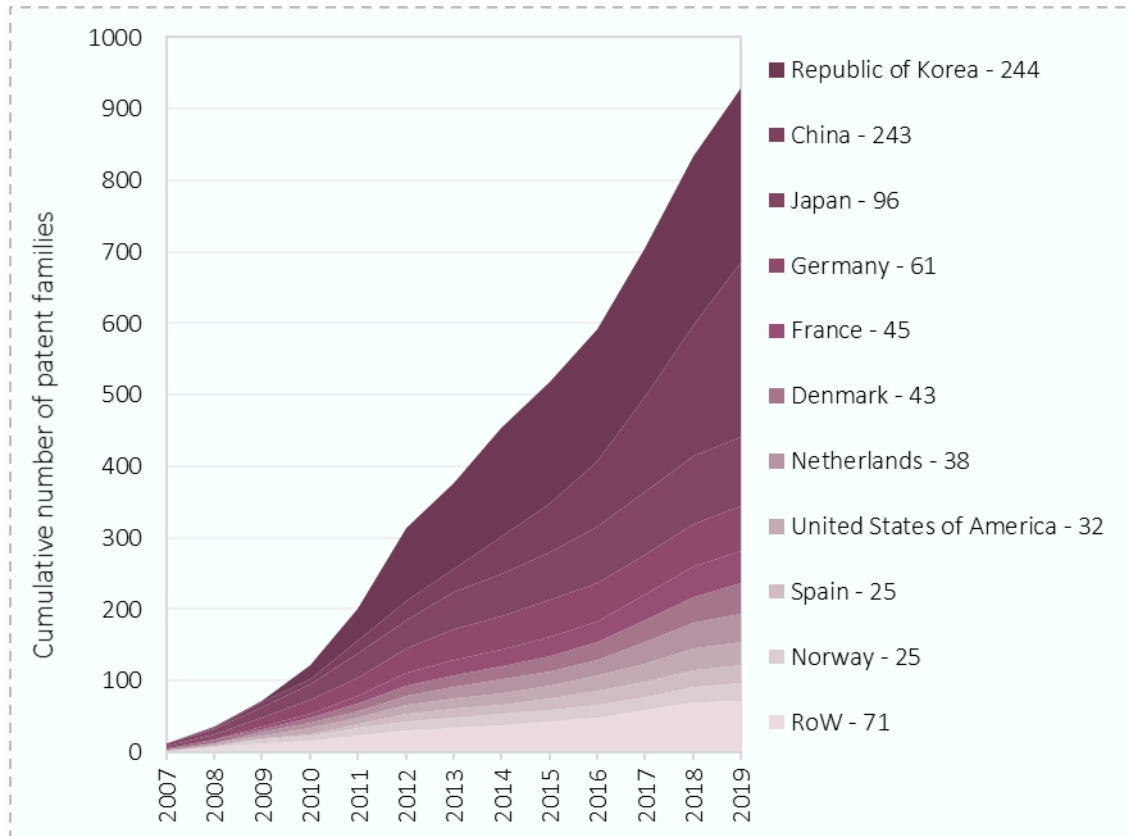
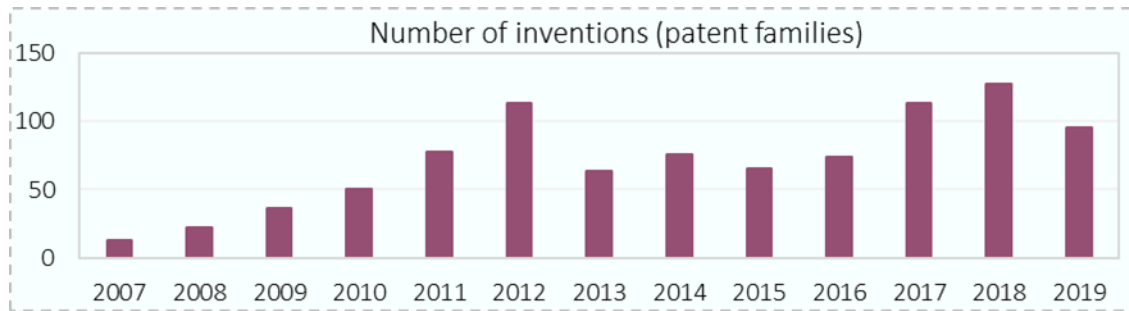
- Design, production, performance, safety and testing

41 countries involved in 2020

- 16 in 2004
- DK chairs TC 88 for wind energy (established in 1988)



Patent families - Inventions



More than **900** new offshore wind inventions

2-waves trend between 2007 and 2019

2015-2019 inventions = 2007-2014 inventions

50% developed in **China** or the **Republic of Korea**

Japan and European countries follow

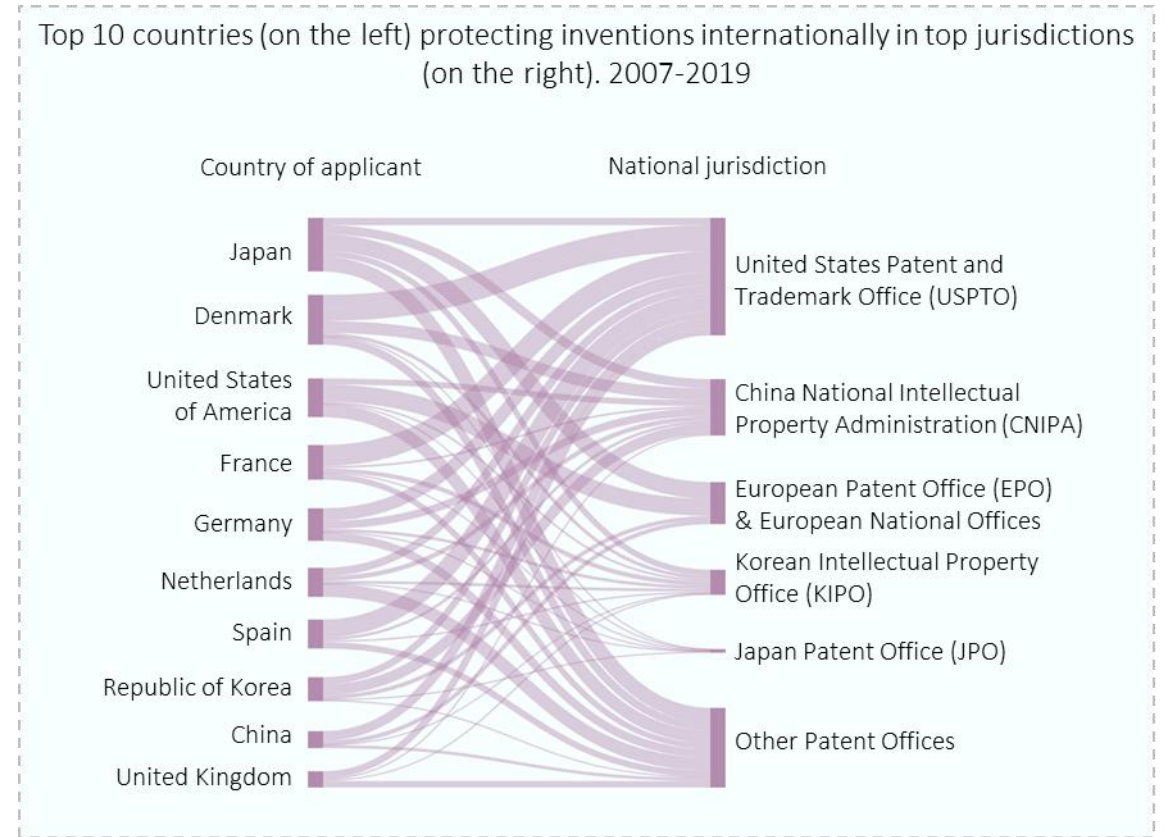
Germany, France, Denmark and the Netherlands

Inventions High-value (left) & International (right)



59% from DE, FR, DK, NL, ES, NO

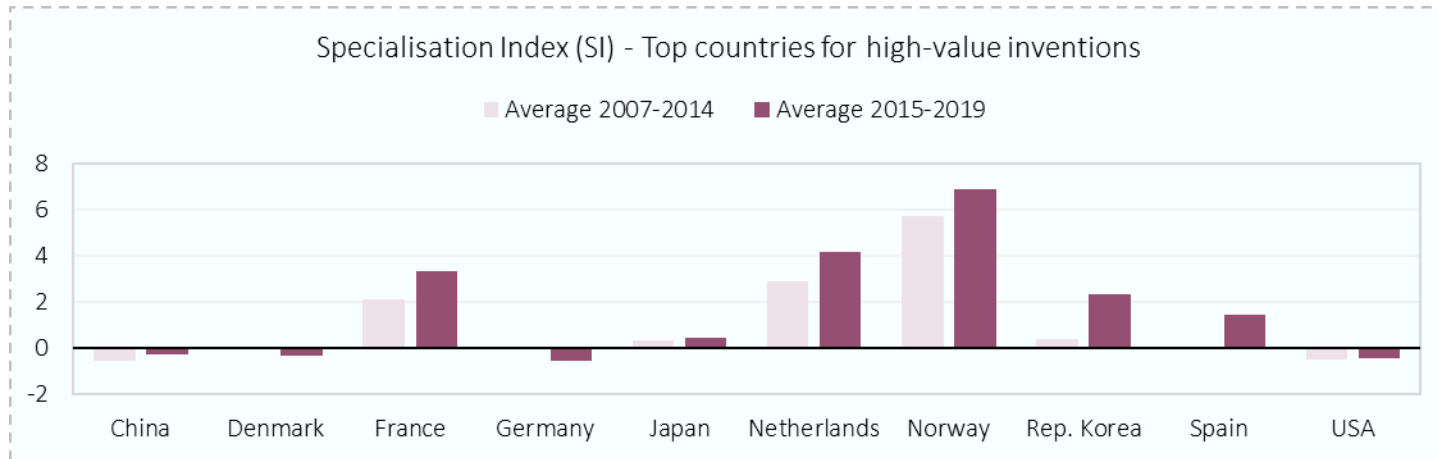
CN and KR focus on **domestic market** (9% and 3%)



66%: JP, US, and EU (DK, FR, DE, NL, ES)

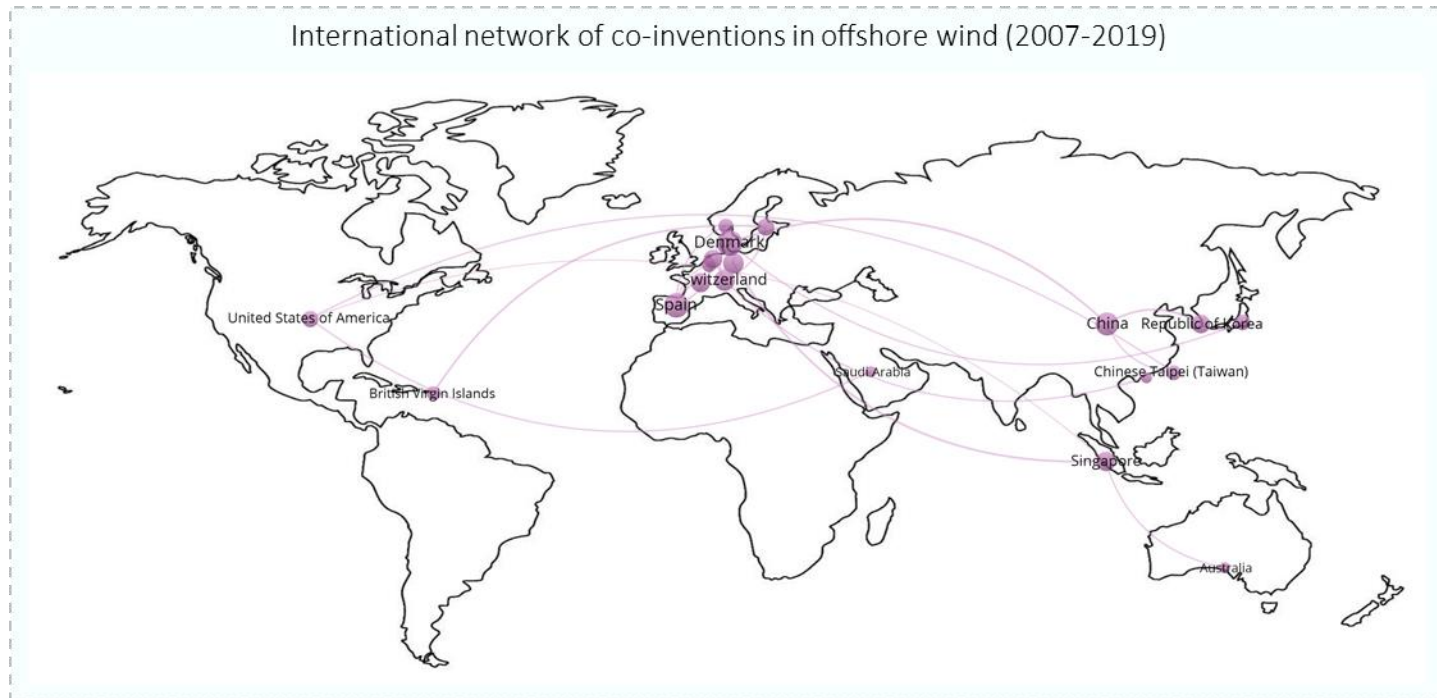
CN: 4% developed but **17% received**

Specialization Index (top) & Co-Inventions (bottom)



NO and NL high specialization → **spillover effect**
 NO: offshore oil and gas
 NL: onshore wind

Increased specialization in KR and ES



30 co-inventions between 2007 and 2019

Europe is **hub** international knowledge alliances

Asian countries engage in **regional alliances**

Patent & Standard

- Need **different metrics** to have clear picture
- China and Republic of Korea are the leading countries but not for high-value or international
- Europe leads high-value and international inventions approach → biggest **market** and **knowledge hub**
- Specialization with **spillover effect** (NO and NL) and ambitious **targets** (KR and ES)
- Benefit from **existing standards** on onshore wind & references to oil and gas industry
- In 2004 first standard published in wind technology, **2012** first applicable to offshore wind
- **Increasing interest** in standards development
 - ✓ Growing confidence in the technology
 - ✓ Readiness and commercialization

Opportunity are rising

Europe is the most mature market for offshore wind

- The key European markets are where new inventions are developed (Germany, Denmark, France and the Netherlands)

United Kingdom is leader for installed capacity, but not in patents → Less R&I and high import

The Netherlands is moving installations beyond 50km and has the second largest capacity installed in 2020

Norway is exploring offshore wind to produce green hydrogen benefitting from national oil and gas expertise

China has the record in new installed capacity in 2020

Republic of Korea shows a remarkable increase in planned new installations and patenting activity (wind target; spillover effect from shipbuilding and steel; own manufacturing capacity of wind turbines)

Thank you for your attention!

inspire@irena.org



Q & A
10 min

THANK YOU FOR JOINING US!

SEE YOU IN OUR NEXT WEBINARS

www.irena.org/events/2020/Jun/IRENA-Insights