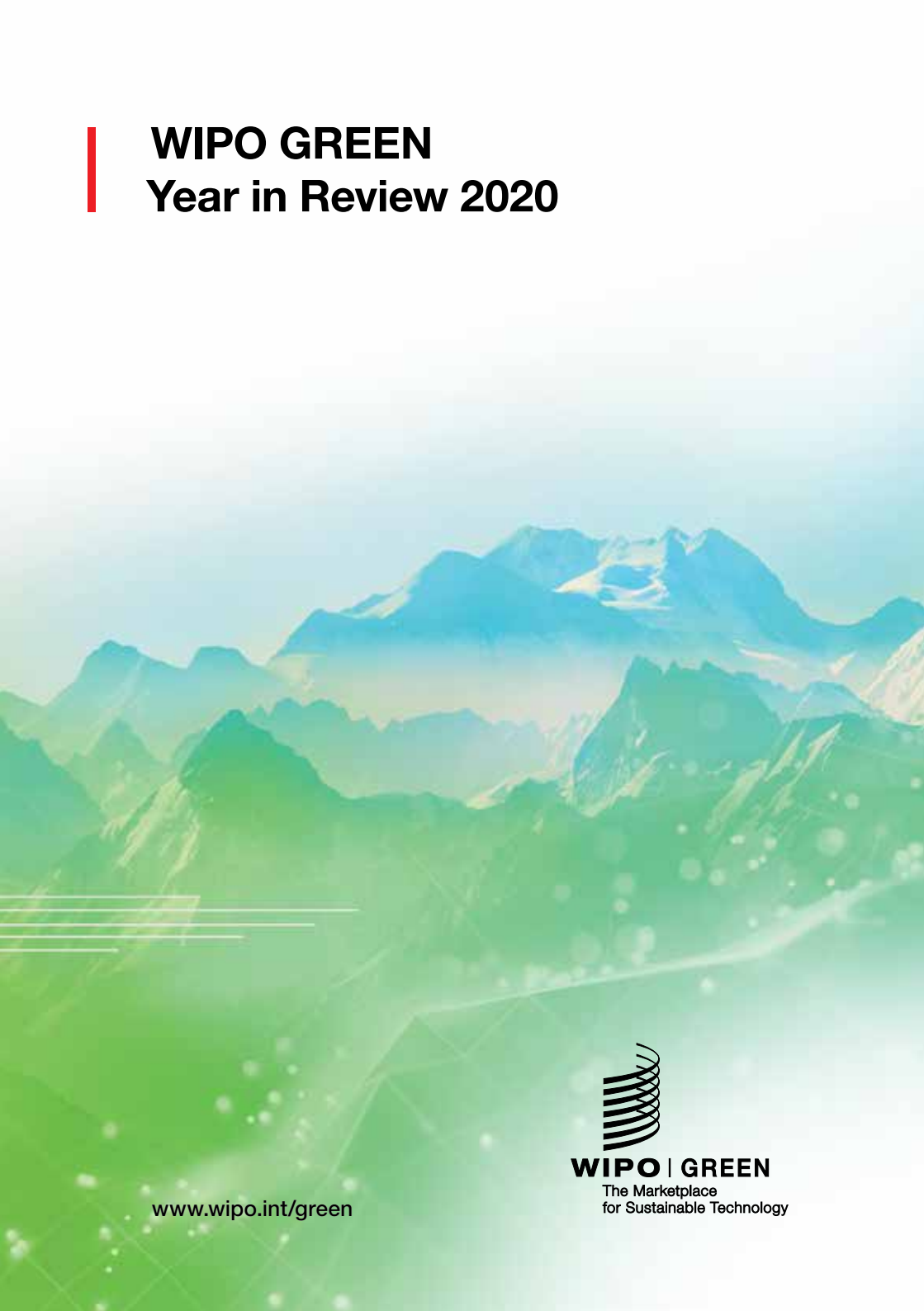
WIPO GREEN
Year in Review 2020



WIPO | GREEN
The Marketplace
for Sustainable Technology

www.wipo.int/green

Letter from the Director General

2020 was a year marked by disruption and transformation. The COVID-19 pandemic accelerated changes to the way we live, work and play. At the same time, it brought home how much we are interconnected and how other critical challenges that we face, such as climate change and sustainability, can only be solved through finding global solutions. In such a year, WIPO GREEN played its part by stepping up efforts to accelerate innovation in green technologies.

WIPO GREEN's core activities in 2020 contributed significantly to supporting green entrepreneurs and making innovation available to users across the world – all with the goal to support the dissemination and adoption of green technologies globally. The Climate Smart Agriculture Acceleration Project in Latin America produced a strong network of new partners in the region.

This year, we saw almost 100 new connections between seekers and developers of green technologies via the WIPO GREEN platform. For the coming year, one of our main goals is to transform our online database and platform into a green business intelligence hub. We are creating a central interface for the exchange of green technology and providing critical insights and tools for our users.

Beyond providing an interface, we intend to begin efforts to expand and improve our support to small- and medium-sized enterprises (SMEs) in this sector, by helping them use IP to take their ideas to address climate change challenges to the market. WIPO GREEN will facilitate pro-bono services through our partner network, assisting SMEs in raising awareness about their successes and needs and improving our matchmaking services to support their business models. WIPO GREEN will also connect SMEs with interested investors, facilitating the challenging journey from a brilliant idea into a marketable product that can change the world for the better.

In 2021, more than ever, we must take concrete steps to ensure that the global IP system helps identify solutions to address the global challenges of our times. If the past year taught us anything, it is that quick action is crucial, global cooperation is essential and change is a given.

Daren Tang
Director General
World Intellectual Property Organization

WIPO GREEN 2020 in numbers

166,000+ — Page views
(107.5% increase, 80,000+ in 2019)

120,000+ — Unique page views
(100% increase, 60,000+ in 2019)

7,400+ — Newsletter subscribers
(10% increase, 6,700+ in 2019)*

3,750+ — Technologies, needs and experts
(21% increase, 3,100+ in 2019)*

770+ — Connections
(15% increase, 670+ in 2019)*

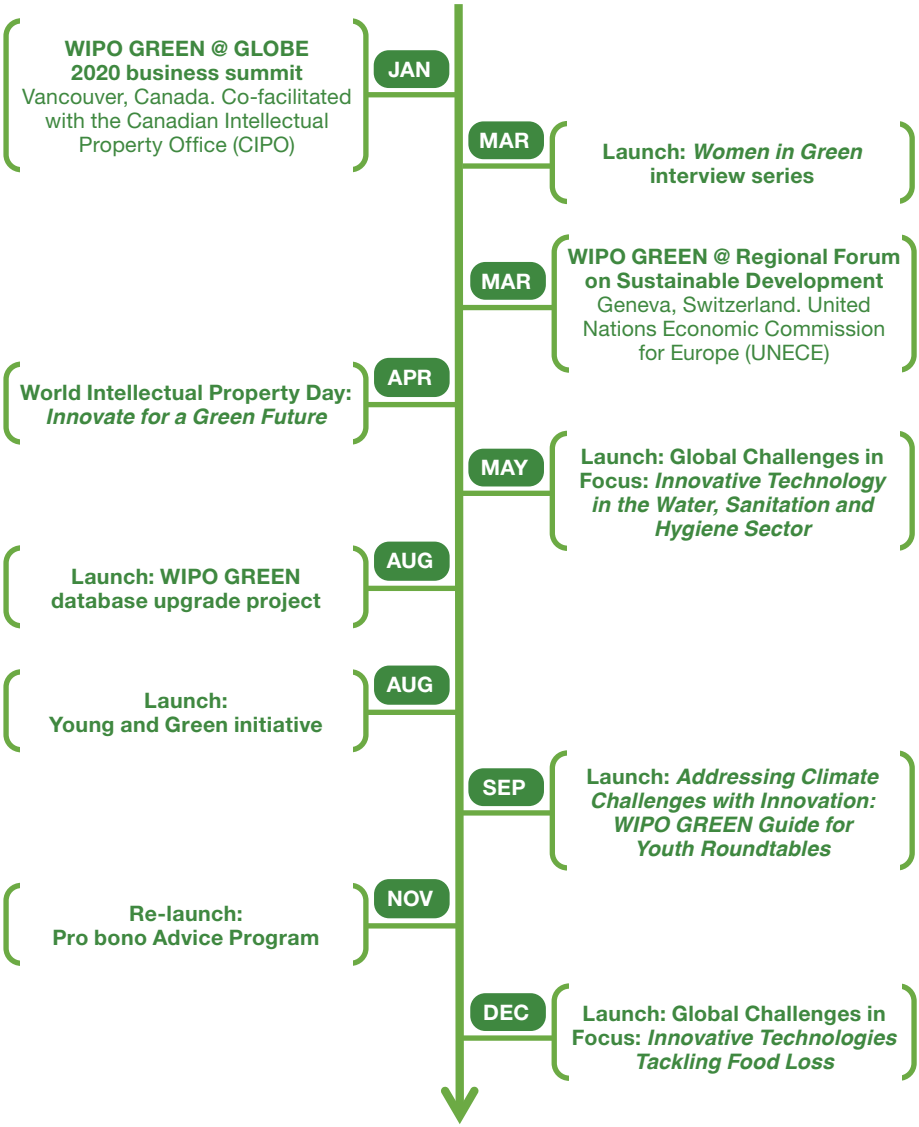
400 — PCT patent applications imported from PATENTSCOPE

119 — Partners
(19% increase, 100 in 2019)*

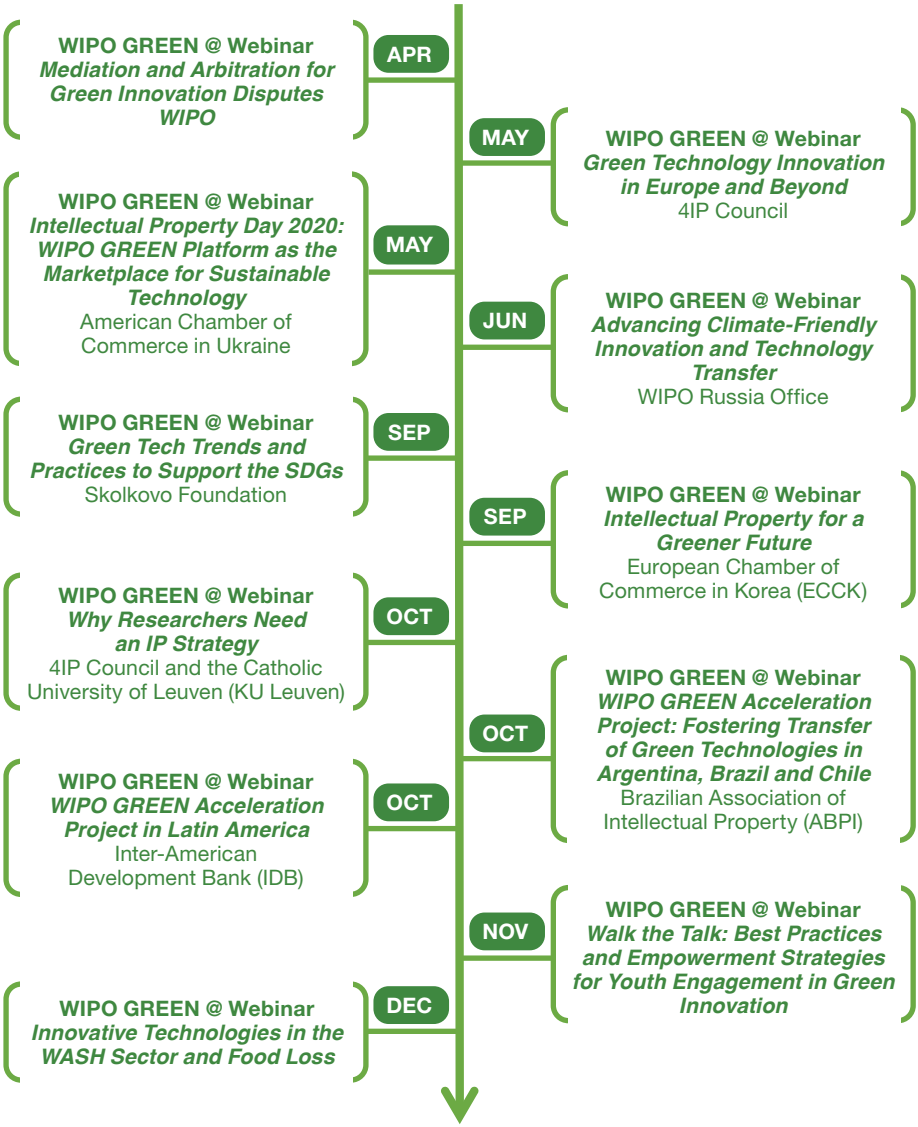
51 — News published
(240% increase, 15 in 2019)

* Cumulative number

2020 launch activities and events



2020 webinar calendar



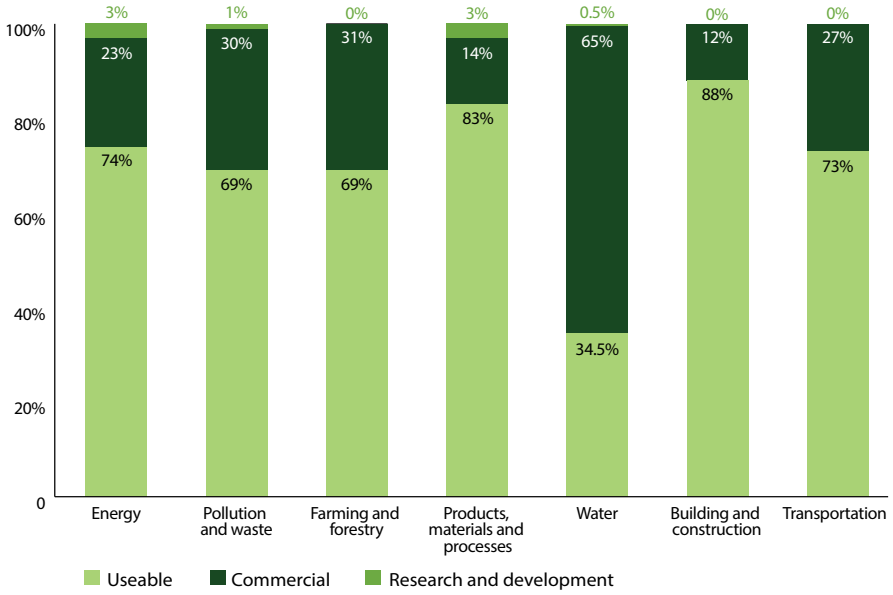
Database highlights

Increase in number of registered users to 1,731 in 2020, up 22% from 1,417 in 2019

Database redesign project:

- Completed: Database engine change to improve stability and efficiency
- Ongoing: Migration to Amazon Web Services (cloud)
- Completed: New design look and feel – scheduled for gradual integration
- Ongoing: Webpage reprogramming in new software environment, with new features such as improved search function
- Ongoing: Import of technologies from PATENTSCOPE

Technologies uploaded by users and partners by their level of development: at a useable level, have a proven record of commercial use, or under research and development (R&D)



The following WIPO GREEN partners were among the most active uploaders to the database in 2020:

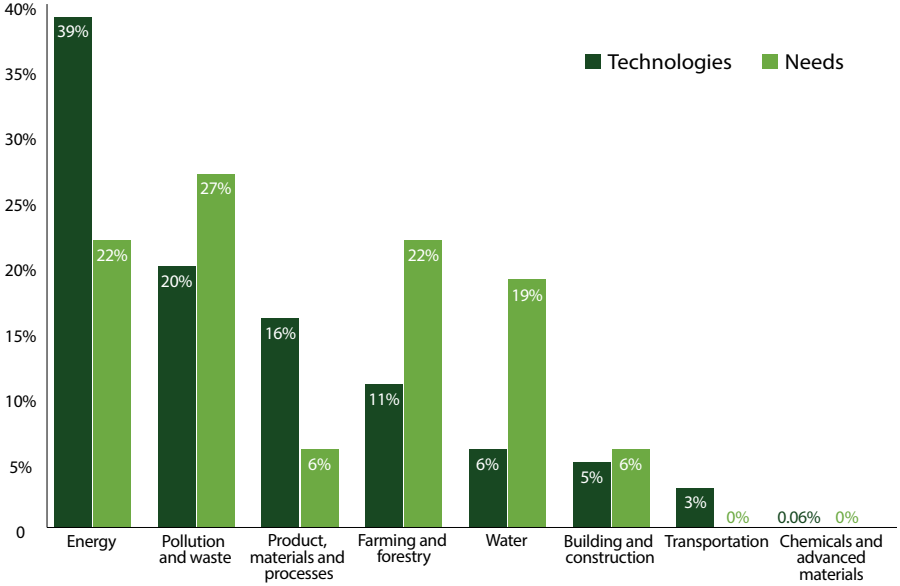
Fujitsu Limited (114), Toyota Industries Corporation (99), Konica Minolta (23), Shiseido Company Limited (20), Bluetech Clean Air Alliance (13), Meiji University Center for Polymer Science (12), Teijin Limited (12).

Canon Inc., Daicel Corporation, Daikin Industries, Green Science Alliance Co., Ltd., Hitachi Ltd., International Business Machines, Panasonic Corporation, Sumitomo Osaka Cement Co., Ltd., Tokai National Higher Education and Research System and Toyo Aluminium Ekco Products Co., Ltd. are also among the WIPO GREEN partners who uploaded select technologies to the database in 2020.

Database uploads

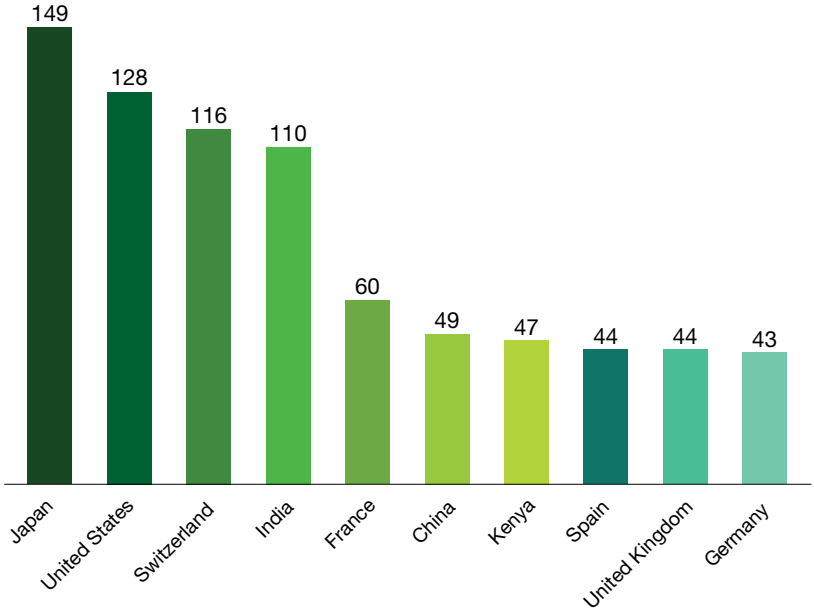
The WIPO GREEN database covers a broad range of technologies at various development stages and in different fields or categories. The distribution of technologies over our major categories varies significantly over time and a current snapshot is depicted. As the database is also comprised of patent applications from the WIPO PATENTSCOPE database, this is likely to cause fluctuations and we seek to balance the categories as much as feasible.

Database uploads by category



Note: This graph shows the percentage of all technologies by category and the percentage of all needs by category.

Top 10 countries by the number of database users



New partners

In 2020, WIPO GREEN welcomed 19 partners from 10 countries across the world, surpassing the numbers achieved in 2019. New partners included multinational corporations, research institutions, universities, business associations and national IP agencies. WIPO GREEN also welcomed organizations from countries not formerly represented, (Chile, Kazakhstan, Lebanon and Malawi).

Partner engagement was enhanced through publication of new resources highlighting partner contributions to the initiative and by introducing new partner categories, to increase efficacy of their participation.

WIPO GREEN partner categories

Database partners
Technical assistance partners
Policy partners
Finance partners
Research and communication partners

CGIAR System Organization

Daicel Corporation

Green Science Alliance Co., Ltd.

Green Technology Center

National Institute of Industrial Property of Chile (INAPI)

International Green Technologies and Investments Center

Intellectual Property Protection Office of Lebanon

Japan Patent Office

Malawi University of Science and Technology

Sagacious IP

Sumitomo Osaka Cement Co., Ltd.

Tianjin TEDA Energy Group Co., Ltd.

Saudi Authority for Intellectual Property

Tokai National Higher Education and Research System

Shiseido Company, Limited

Shobayashi International Patent and Trademark Office

Toyo Aluminium Ekco Products Co., Ltd.

Skolkovo Foundation

Toyota Motor Corporation

World IP Day 2020: Innovate for a Green Future

In 2020, World Intellectual Property Day, WIPO's annual awareness campaign, took a closer look at green innovation and sustainable technology, under the timely theme, *Innovate for a Green Future*. The World IP Day Pledge Map contained over 500 pledges for a green future from every corner of the world. To support the initiative, WIPO GREEN prepared stories showcasing a number of climate-friendly technologies featured on the WIPO GREEN online database.

Photo: PadCare Labs

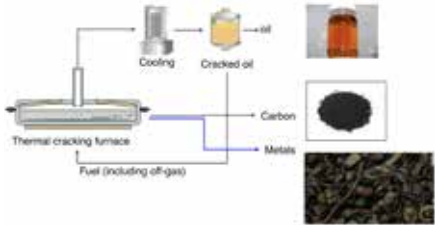


Photo: Fujitsu Limited

PadCare Labs, India, invented Saneco – an eco-friendly sanitary napkin disposal and recycling unit – that uses a "5D" (disinfection, decolorization, deodorization, deactivation and disintegration) chemo-mechanical process, decomposing a sanitary napkin within 30 seconds. The resulting by-product can be recycled as fuel or material for the paper industry.

Fujitsu Limited, Japan, developed a waste plastic conversion technology for liquefaction of waste plastic. It allows for production of reusable oil from waste materials that are often not recycled or recyclable. The technology can efficiently remove resin and recover rare metals from waste that would otherwise be incinerated.

Photo: Net Sas

ANTISMOG, a climate-friendly, open-source process and technology solution developed by Net Sas, France, reduces harmful emissions from combustion engines by up to 80 percent. The hydrogen fuel enhancement technology used in the ANTISMOG process is a pre-combustion solution, allowing for a more complete fuel combustion thereby significantly reducing the number of unburned particles and increasing fuel efficiency.

Photo: ECOLOO AB

ECOLOO AB, Sweden, invented ECOLOO, a stand-alone, decentralized biological toilet, system that treats human waste by breaking down the solid waste into particles or ashes and converting the liquid waste into natural fertilizer. All biodegradable materials are digested by the bacterial culture present in ECOLOO's chambers, including toilet paper and other degradable sanitary products.

Outcomes: Acceleration Project in Latin America

Main partners

National Institute of Industrial Property (INPI Argentina)
Ministry of Foreign and Cultural Affairs (Argentina)
National Institute of Industrial Property (INPI Brazil)
Ministry of Economy (Brazil)
National Institute of Industrial Property (INAPI Chile)
Ministry of Economy (Chile)

Other partners

Ministry of Environment and Sustainable Development (Argentina)
Ministry of Science, Technology and Innovation (Argentina)
Agricultural Research Corporation (EMBRAPA) (Brazil)
Industry association Wines of Chile (Chile)

Based on a request from the National Institute of Industrial Property (INPI Brazil), in 2019 WIPO GREEN initiated an Acceleration Project in Latin America with a focus on climate smart agriculture. The project explored local challenges and potential green opportunities in:

- intensified crop rotation, soil re-carbonization and carbon sequestration, zero-till agriculture and forest management in Argentina
- zero-till or conservation agriculture in Brazil
- wine production in Chile.

WIPO GREEN and its partners implemented matchmaking activities from October 2019 to March 2020. In the first phase of the project, 17 technology seekers, 31 needs and 65 solutions were identified. The majority of the technology providers and seekers were from private and public sectors in Argentina, from public and civil society organizations in Brazil and from private companies in Chile. Following identification of potential matches and necessary introductions, 10 letters of intent were signed by interested parties as a formal indication of their common interests and as a basis for further discussions.

Originally implemented as a short-term activity, the project is now entering its second phase in part to strengthen partner engagement and to build upon the success from the initial phase. Partners in all three countries have developed strategies to continue the project. New activities include conducting sectoral studies that will help identify major innovators, technologies and demands in specific areas. In 2021, we plan to organize matchmaking events for green technology actors such as IP institutes, government agencies, entrepreneurs, development institutions, universities, research and technology institutions, industry associations and small and large companies.

Examples of collaborations

Argentina: Grafin Agro S.A. and Dymaxion Labs

Soil and green vegetation analysis that informs nutrient contents in the ground is a critical tool, since optimal nutrient content in the soil improves plant growth, mass, as well as protein and gluten content, which in turn, increases the price. However, outside of laboratory analysis, no quick and reliable method to estimate a crop's gluten content is available at farm level, creating challenges for agricultural companies such as Grafin Agro S.A.

Thanks to real-time Internet of things-based (IoT) information, Dymaxion Lab's Dymax platform allows deep analysis and discovery of patterns, for example, in crop monitoring. The company already works with satellite-based Normalized Difference Vegetation Index (NDVI) and other tools, which can monitor vegetation health and biomass; a specific model for gluten estimation is under development.

Brazil: Brazilian Agricultural Research Corporation (EMBRAPA) and Volocopter

Several crops and grasses in the area of Mato Grosso do Sul in central Brazil are affected by the invasion of the insect *Scaptocoris castanea*. To improve pest-control as well as the general maintenance of crops, the region is looking for options for automated aerial monitoring technologies.

Volocopter and John Deere have teamed up to develop a crop-spraying autonomous agricultural drone. Sharing synergies with the existing Volocopter platform, VoloDrone is an unmanned, fully electric utility drone, capable of carrying a payload. The VoloDrone increases productivity in a number of areas, including plant protection, seed sowing, forest management and frost control.

Chile: Viña Castellón Winery and Tesla Energy

Viña Castellón, a winery estate in the Itata Valley of Chile, is experiencing increasing rates of water stress incidents and seeks a low-cost, low maintenance, sustainable power supply for irrigation with pumping capabilities, as the plantations are located in hillock areas.

Tesla Energy offers photovoltaic solar panels, which can generate inexpensive and safe electricity locally. This clean energy can be used by agricultural companies in their irrigation systems, lighting systems, cold rooms, ventilation and climate control, as well as to monitor and control production processes and post-harvest tasks.

Global Challenges in Focus

Innovative technology in the water, sanitation and hygiene sector

Photo: WIPO / Oksen

In May, WIPO GREEN published a new brief in the *Global Challenges in Focus* series, *Innovative Technology in the Water, Sanitation and Hygiene (WASH) Sector*. The brief explores the water supply aspect of WASH and highlights the role of technological innovation in managing limited freshwater resources and scarcity and/or threats to the water supply's quality.

The topic of water is paramount: it affects food security, health, economy, the environment and all other spheres of social functioning. The brief opens by highlighting the freshwater challenge, offering statistics demonstrating the essential need for adequate and stable supplies of clean and fresh water. WIPO GREEN's expertise lies particularly in innovation and technology, which play a crucial role in sustainable water management. The primary focus of the publication is on the use of innovation and technology to improve the water management process throughout its various components, including reserves replenishment, sustainable extraction, transport and distribution, as well as treatment and disposal of wastewater.

The brief addresses paths in which innovative water-management technologies have developed, for example: early warning systems, remote sensing and geographical information systems (GIS), satellites, unmanned aerial vehicles (or drones), blockchain technologies and water loss and sensor-based management systems. The publication specifies advantages and limitations of these solutions and includes real-world, practical examples, as well as innovations in development, such as desert water harvesting technologies.

Innovative technologies tackling food loss

In December, WIPO GREEN released a new *Global Challenges in Focus* brief, *Innovative Technologies Tackling Food Loss*, which explores cutting-edge technologies to reduce food loss in the supply chain.

Food loss and waste are global challenges. In 2011, 1.3 billion tons or roughly one-third of globally produced food was lost or wasted. The United Nations Sustainable Development Goal (SDG) 12 calls for global food waste at the retail and consumer levels to be halved by 2030, as well as the reduction of food loss along production and supply chains, including post-harvest losses.

The brief identifies "critical loss points" – the points at which food loss has the largest impact across the supply chain. Such points include harvesting, storage, packing, transportation and food processing, among others, and vary across different products (from cereals to milk to meat). It is at these points that innovation can help reverse the food loss process.

The publication further clarifies the current needs existing at every loss point, such as improved monitoring of storage conditions, proper ventilation and innovative food preservation techniques. The brief then summarizes several technology solutions with high potential in tackling food loss, currently being developed and deployed across the food supply chain from harvest to retail. These include solutions for agricultural production (such as use of big data), post-harvest operations (such as the emerging electro-osmotic dewatering systems), processing (such as ultrasound), storage and transportation (such as "superchilling"), packaging (such as "active packaging"), as well as solutions for the whole supply chain (such as artificial intelligence or autonomous robots).

In continuation of the topic of food management, a forthcoming paper will address the technologies tackling food waste.

Young and Green: Youth engagement initiative

On International Youth Day 2020, celebrated under the theme *Youth Engagement for Global Action*, WIPO GREEN launched its new youth engagement initiative, Young and Green, with a special interview series, *Faces of Innovative Youth*.

The initiative's first outcome is WIPO GREEN's practical guide to empower youth to advance green innovation, *Addressing Climate Challenges with Innovation: WIPO GREEN Guide for Youth Roundtables*. Created to facilitate group discussions and inspire action, the guide incorporates theoretical resources and practical tools for using green technologies and IP to empower youth in their efforts to address climate change.

This WIPO GREEN guide for youth roundtables is recommended for:

- students and young professionals with an interest in climate change
- students, young innovators and professionals in the fields of technology, engineering, sciences and other related fields
- young change-makers and environmental advocates
- middle- to high-level educational institutions, professors and tutors in relevant fields
- WIPO GREEN partners seeking to develop or enhance their youth engagement efforts.

In November, WIPO GREEN hosted the webinar *Walk the Talk: Best Practices and Empowerment Strategies for Youth Engagement in Green Innovation*. The webinar, opened by WIPO Director General Mr. Daren Tang, gathered 10 expert speakers, including young green technology innovators and global experts in youth empowerment and sustainable innovation from EIT Climate-KIC, Swiss Federal Institute of Technology (EPFL), the World Economic Forum (WEF) and World Food Programme (WFP).

The webinar provided a platform for young innovators to present their business ventures and share their experiences and opinions regarding youth-driven sustainable innovation. It allowed the speakers and the engaged audience to share different perspectives on how to leverage youth potential in addressing climate change.

WIPO GREEN is looking forward to continued activities under the Young and Green initiative in 2021.

Women in Green: Interview series

In March, WIPO GREEN launched its new interview series, *Women in Green*. The series features female innovators and green entrepreneurs interviewed about their inventions, the development of their businesses and their experiences in the eco-friendly technology and innovation field.

Photo: Padcare Labs

Sarika Kulkarni, an inventor and a design lead at PadCare Labs, a start-up company focusing on climate-friendly menstrual hygiene management in India created Saneco, a sanitary napkin disposal and recycling unit.

My advice to young women is to believe in themselves and to believe that what they do matters for science and for society.

Mónica Abarca, a young entrepreneur and innovator whose start-up company qAIRa focuses on addressing air pollution and is revolutionizing access to air quality information in Peru. Invented a personalized multirotor called Andean Drone and a low-cost static module called qHAWAX for air quality monitoring.

The current environmental challenges we face should motivate you. The current political discourse and strong international focus on climate action is your opportunity to make a difference.

Photo: Mónica Abarca

Photo: Ghana Bamboo Bikes

Bernice Dapaah is a multi-award winning entrepreneur and innovator in the field of smart mobility systems. Her medium-sized company, Ghana Bamboo Bikes, creates bicycles from a locally available material - bamboo - and encourages the shift toward eco-mobility and integrated transport in Africa and beyond.

I am witnessing a great door of opportunity opening to women, thanks to global effort to promote gender mainstreaming in many business-support programs. It is particularly encouraging to know that attention is now turning to small-medium enterprises, which form the largest part of most economies. This means that women do not have to manage large multinational companies before they are heard or given the necessary support they need to shine.

Sandra Pascoe Ortiz, winner of the first National Invention Award of the Mexican Institute of Industrial Property (IMPI), developed an eco-friendly alternative to plastic material: a biodegradable material developed using the juice of succulent plants, in particular the Opuntia megacantha cactus, which is widely present in Mexico.

I got involved in the field of sustainable innovation in order to contribute my efforts to reversing the environmental damage from our technological development. I believe we must take advantage of that same development to improve our quality of life and that of future generations.

Photo: Universidad del Valle de Atemajac

Special news series: Green technologies in…

In 2020, WIPO GREEN published a number of special news featuring sustainability trends in different technological areas. The special features will continue in 2021, published on the WIPO GREEN website and as part of the WIPO GREEN monthly newsletter.

Subscribe to the WIPO GREEN monthly newsletter

wipo.int/green

March	Water and climate-friendly technology
May	Climate-friendly information and communication technology
June	Green innovation for food safety
	Small- and medium-sized green enterprises
September	Sustainable tourism
October	Green technology for food and agriculture
November	Sustainable toilets and climate change
December	Green innovation for global civil aviation

World Intellectual Property Organization
34, chemin des Colombettes
P.O. Box 18
CH-1211 Geneva 20
Switzerland

Tel: +41 22 338 91 11
Fax: +41 22 733 54 28

For contact details of WIPO's
External Offices visit:
www.wipo.int/about-wipo/en/offices

Printed in Switzerland

WIPO Publication No. 1058E/2021
978-92-805-3256-2