Framework Convention on Climate Change

TEC/2023/27/19

Technology Executive Committee

05 September 2023

Twenty-seventh meeting

19–21 September and 22 September 2023 (TEC-CTCN Joint session)

Green Technology Databases

Concept note

I. Background

1. The Technology Mechanism included in its joint work programme for 2023-2027 a joint activity on digitalization. The TEC and CTCN Advisory Board (CTCN AB) at its joint session on 24 March 2023 decided to establish a joint taskforce to provide further guidance on this work inter-sessionally.

2. The TEC and the CTCN AB requested the joint taskforce to produce a draft concept note on green technology databases to inform possible best ways for green technology databases to be delivered to countries in terms of usability and effectiveness with a view to enhancing support for technology development and transfer.

II. Scope of the note

3. The annex to this note contains the concept note on green technology databases prepared by the CTCN Secretariat under the guidance of the joint taskforce.

III. Expected action by the Technology Executive Committee

4. The TEC and the CTCN AB will be invited to consider the concept note contained in the annex and provide guidance on further work on this matter.

Annex

Concept note on Green Technology Databases

I. Background

1. This note is produced based on written inputs provided by the World Intellectual Property Organization (WIPO) and is focused on the existing green technology database platform maintained by WIPO Green to which the CTCN and other institutions are partners. This note has been produced as an outcome of the TEC-CTCN joint activity on green technology databases and on the request by the TEC and the CTCN Advisory Board to the joint taskforce to produce a concept note on green technology databases.

2. WIPO GREEN[1] is a matchmaking platform promoting the deployment of innovation and green technology as solutions to some of the challenges posed by climate change, food security and the environment. The database of needs and green technologies is the technical backbone of WIPO GREEN and is used in various activities such as on-the-ground matchmaking (acceleration projects), automatic and manual matchmaking, highlighting in technology collections, and production of various knowledge material including the Green Technology Book[2] compiled in partnership with CTCN.

3. The database was created around 2013 when WIPO GREEN was started, and a large number of technologies were exported to the CTCN knowledge management system in around 2015, but not updated since. It is estimated that between 33% to 50% of the technologies in the CTCN knowledge management system originate from WIPO GREEN.

4. In 2021, the WIPO GREEN database[3] was completely rebuilt and enhanced with new content, content types and advanced matchmaking functions. The database is under constant development with a dedicated developer. The database has AI assisted full text search tool designed to make it easier to find solutions for any needs. It requires the users to enter a long text, for example parts of a project description or something that well describes what the user is looking for, and the tool will generate relevant keywords to be used in the search. Users can also upload documents as input. Users can choose which suggested keywords to use and can instruct the search engine to look for the exact phrases rather than individual keywords. This option often yields better results and is on by default. Ten keywords are chosen by default, but the user can modify which and how many keywords to use.

5. The database is an UN-based, free, public resource, fully financed by WIPO. The database is openly searchable by the public. Registration is required for uploading and for contacting technology providers. There are no fees. Through promotion of innovation and technology as solutions to global challenges, WIPO supports the national systems of innovation and technology transfer, both in which intellectual property rights are prominent and enabling factors.

II. Objectives

6. The WIPO GREEN database is based on the perception that there is a gap in knowledge between tangible needs because of climate change and other environmental challenges, and available innovation and technology-based solutions. This includes limited knowledge of the existence of the solutions, imperfect understanding of their technical and economic feasibility, and various barriers in the technology transfer process, both to market and between markets.

7. The WIPO GREEN database seeks to address these shortcomings by providing accessible information on solutions available or upcoming. The database is designed to make the point of being an easily accessible database and being inclusive. Many technology platforms focus on the best, the most advanced, the most efficient, the most promising investment technology etc. The WIPO

[1] https://www3.wipo.int/wipogreen/en.
[2] https://www.wipo.int/green-technology-book-adaptation/en.
[3] https://wipogreen.wipo.int/wipogreen-database/database.

database, however, operate on the basis that in order to mitigate and adapt to climate change, we need not only the best, but thousands of diverse solutions, some of which may not be the most advanced or efficient, but may be exactly what is needed in a specific context. Hence, the database is open to all serious and realistic innovation and thereby designed to provide a broad picture of innovation, diversity, and inclusiveness.

III. Focus areas of the green technology database

8. Green technologies are broadly defined as technologies that "protect the environment, are less polluting, use all resources in a more sustainable manner, recycle more of their wastes and products, and handle residual waste in a more acceptable manner than the technologies for which they were substitutes" (Agenda 21, The United Nations Program of Action, Rio, 1992).

9. The database contains seven overall technology categories, each with several sub-categories (altogether 82; full list on last pages). The category icons on the landing page open collection pages with short introduction to the technology category and highlighting of most popular sub-categories and features uploads. The top-level categories are:

(a) Energy;

(b) Water;

(c) Farming and forestry;

(d) Pollution and waste;

(e) Transportation;

(f) Products, materials and processes;

(g) Building and construction.

IV. Main features of the green technology database

10. Main features of the database include:

(a) Advanced, scalable tailor-made database programmed in Angular by professional software developers (Sword Group, Athens office) in 2021;

(b) Contains the following types of data:

(i) User-uploaded needs and technology descriptions;

(ii) Green technology patent applications imported from the WIPO Patentscope database;

(iii) User-uploaded expert profiles;

(iv) Knowledge materials;

(v) Financiers and financial partners are planned to be added in 2024;

(vi) All uploads can include images and attachments e.g. drawings, videos, CVs, documents etc.;

(c) Currently that database holds 3267 user-uploaded technologies, 378 user-uploaded needs, 293 user-uploaded expert profiles, 44 knowledge materials, 818 imports from American University Technology Managers (AUTM), and 124,226 imported patents. Altogether, the database holds 129,025 articles as of mid-July 2023. More than 3000 searches per month are performed;

(d) All user-uploaded items have links to the owner's website and the option for contacting the owner by email without displaying the email address publicly;

(e) Patents link to the Patentscope database for further details;

(f) Need owners can choose to appear without name through an anonymous upload function;

(g) Uploads can be done on behalf of a need and technology owner e.g., by consultants;

(h) Unlimited upload using a comprehensive upload form with data entry for e.g., environment benefits, technology features, development status, business opportunities, technical assistance, investment sought, intellectual property status etc.;

(i) Simple and advanced search functions. Searches by default include all content types in the database. This means that a search for "solar" will show needs and technologies relevant for solar energy, experts profile with experience herein, relevant patents, and knowledge material;

(j) Unique AI-based "Full Text Search" function where users can paste in a full need description, upload a document, or point to a website that contains a description of the user's project or need;

(k) Always-on, AI-assisted auto matching;

(l) Saved searches and alerts. Users can save a search and request automatic email alerts, triggered when a new upload corresponds to their search criteria;

(m) Automatic AI-based matching after uploading a need or a technology. Users will receive a list of relevant needs and similar technologies or vice versa;

(n) Advanced non-hierarchical filtering. Currently 16 groups of filters can be applied alone or in combination such as source, type, collections, categories, company, country, developed in, deployed in, collaboration sought (license, sale, joint venture etc.), type of technological transfer, type of finance sought etc;

(o) Integration with the Green Technology Book. All technologies shown are linked to the database for further details and contact options;

(p) Dedicated collection for the Green Technology Book previous and current editions with table-layout view of technologies;

(q) Unique AI-based search function for patents. The "Patent2Solution" search function is available for patents and will launch a multi-parameter Google-search based on AI analyses of the patent description. The search favors commercial sites and is meant to help users explore whether a patent, or a technology similar to that specific patent, is actually available on the market, and hence a potential solution;

(r) Graphical display of Technology Readiness Level (TRL) of user-uploaded technologies;

(s) Option to feature or highlight individual uploads;

(t) User dashboard providing overview of uploads, list of relevant needs and technologies, statistics on their uploads such as number of times viewed, bookmarked etc.;

(u) Guided tour of the database features on first use;

(v) Upload user guide in six languages.

11. Near-future developments include:

(a) Tailored partner gateways and collections;

(b) Guidance on finding legal status of patents;

(c) Multilanguage support;

(d) AI-based summarization of patent descriptions;

(e) Financiers as new article type.

V. Data quality assurance

12. A user needs to register and obtain permission to upload and to contact another upload owner. All other functions are open to the public without registration. WIPO consults the requestor's website and other available information to ascertain the seriousness and feasibility of the technology etc. However, WIPO do not assess the claimed qualities, vet or in any way test the uploaded technologies.

13. Once a user has been approved, there are no barriers to uploading. However, WIPO keeps a close eye on uploads and contact owners if there are quality issues. WIPO has full control and can edit, delete, suspend and block uploads and users. This is seldom necessary, and users normally control their own uploads without interference from WIPO.

14. The green technology patents in the database have been selected based on a detailed examination of the European Patent Office's Y02 classification for climate change mitigation and adaptation technologies. This is to best of information the currently most precise public classification of green technologies, albeit focusing on climate change benefits. In practice, this covers most of green technologies considered relevant for the platform. Based on the examination, a large number of filters are applied to the Y02 classes to isolate the most relevant green technologies, which were subsequently imported through the WIPO Patentscope database. A weekly refresh import is being implemented.

VI. Partners and CTCN integration

15. WIPO strives to make the database useful for the general public as well as for other organizations working in the space of innovation and green technology. It therefore welcomes partners to use the database actively as a repository and matchmaking tool for their needs, technologies, experts and knowledge material. WIPO is open to create special gateways into the database for such partners, designed by themselves, make special collections, or they can make their own gateway, linking (through an URL link) to collections and searches in the WIPO database.

16. The WIPO GREEN database is available at no cost, except possibly if special advanced programming is required. For partners, the advantage is that they avoid costs and efforts for building and maintaining their own database infrastructure. For WIPO GREEN, the advantage is greater reach and impact as well as more relevant uploads in the database. Bulk import to the WIPO GREEN database may be feasible.

17. Integration with the work of CTCN could be done in several ways. The database is an active catalog of potential technology solutions and needs, infinitely expandable and can respond quickly to special requests through new collections etc.

18. WIPO would be very interested in the database being used directly by CTCN member countries as a resource for inspiration and finding actual tangible solutions to major climate change related challenges. This can be done by encouraging Nationally Designated Entities (NDEs) to upload specific needs to the database. These needs will be auto matched in the database but can also be assisted with tailored staff-based matchmaking.

19. As such, it can be the main technology and solutions repository of CTCN and the work with the NDEs, Technology Needs Assessments (TNAs) etc. It could also be linked to the technology taxonomy, be used for repository of knowledge material, and could host the planned roster of gender experts.

VII. Full list of database technology categories

Database technology categories
Transportation - Aeronautics/Aviation
Transportation - Electric/ Hybrid vehicles
Transportation - ICT based transport solutions
Transportation - Improved internal combustion engines
Transportation - Maritime/ Waterways
Transportation - Railways
Transportation - Road
Energy - Biomass/Bioenergy
Energy - Electrical engineering
Energy - Energy efficiency

Database technology categories
Energy - Energy generation (Others)
Energy - Energy storage
Energy - Energy transmission and distribution
Energy - Hydrogen & Fuel cells
Energy - Geothermal
Energy - Hydropower
Energy - ICT in energy and energy management
Energy - Solar
Energy - Thermal
Energy - Waste heat recovery
Energy - Waste to energy
Energy - Wave/Tidal/Ocean
Energy - Wind
Water - Coastal protection
Water - Desalinization
Water - Flood control
Water - Sanitation
Water - Water extraction
Water - Water reserves assessment, monitoring, & control
Water - Water storage
Water - Water transport & distribution
Water - Water treatment
Water - Water use efficiency
Farming & Forestry - Farming technologies
Farming & Forestry - Fish farming (aquaculture)
Farming & Forestry - Food processing
Farming & Forestry - Forest production (silviculture)
Farming & Forestry - Forest, biodiversity and ecosystem restoration / conservation
Farming & Forestry - GIS & Earth Observation
Farming & Forestry - Harvest and storage
Farming & Forestry - Hazard prevention and early warning systems
Farming & Forestry - ICT in farming
Farming & Forestry - Improved farm inputs
Farming & Forestry - Irrigation
Farming & Forestry - Land use management
Farming & Forestry - Livestock
Farming & Forestry - Plant & livestock varieties
Farming & Forestry - Soil improvement
Farming & Forestry - Stress tolerant cultivation
Farming & Forestry - Greenhouse & Indoor
Pollution & Waste - Air
Pollution & Waste - Bio-remediation
Pollution & Waste - Carbon capture & storage
Pollution & Waste - Cleaner coal
Pollution & Waste - Food waste

Database technology categories
Pollution & Waste - ICT in pollution & waste management
Pollution & Waste - Land
Pollution & Waste - Measuring and monitoring Green House Gasses
Pollution & Waste - Pollution detection, measurement, monitoring and removal
Pollution & Waste - Recycling & reuse
Pollution & Waste - Solid waste management
Pollution & Waste - Waste avoidance
Pollution & Waste - Waste collection & transport
Pollution & Waste - Waste disposal
Pollution & Waste - Wastewater treatment
Product, materials and processes - Bio based products
Product, materials and processes - Biodegradable/ Biocompatible products
Product, materials and processes - Chemical & industrial processes
Product, materials and processes - Improved materials
Product, materials and processes - Mining & metals
Product, materials and processes - Packaging materials & fabric
Product, materials and processes - Products that avoid toxic or other emissions
Product, materials and processes - Products that save water/energy
Product, materials and processes - Sustainable fashion & textiles
Building & Construction - Buildings
Building & Construction - Construction material
Building & Construction - Heating, cooling, ventilation, heat pumps
Building & Construction - Home appliances
Building & Construction - ICT in buildings & urban management
Building & Construction - Lighting
Building & Construction - Thermal insulation
Building & Construction - Urban planning