

Inter-Office Communication

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Subject: Commercial Potential of “Sustainable Combined Solar/ AnMBR Process for Wastewater Treatment”.

CD/021/2022

Please find attached for your reference ,brief report on the Commercial Potential of Sustainable Combined Solar/ AnMBR Process for Wastewater Treatment, which was prepared by Ms. Fatemah Shah from STID. The report summarizes potential market and patent landscape of the technology with the recommendations from the IP Committee.

Thank you.

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10:35

Commercialization Review of “Sustainable Combined Solar/ AnMBR Process for Wastewater Treatment”

Introduction

“Sustainable Combined Solar/ AnMBR Process for Wastewater Treatment”, was reviewed by KISR’s Commercialization Division, KISR’s IP Committee and KISR’s patent attorney representatives in the USA; Nath, Goldberg & Meyer (NGM) . The IP is part of a proposed research project (WT071K). The review focused on three aspects in relation to the proposed technology, they are:

- The research strategy which aims to build R&D in the field of wastewater treatment with strong IP portfolio.
- IP protection strategy, with strong and suitable protection for future development, and the commercial strategy.
- The commercial strategy for a strong potential for commercial implementation and/or technology transfer, that is viable and suitable for the market, and with respect to the research strategy.

The Research Strategy Review

Project title “Solar-Still Assisted AnMBR for Energy Efficient Wastewater Treatment” is proposed under KISR’s 9th Strategic Plan by the Wastewater Treatment and Reclamation Technologies Program under the research development of wastewater treatment technologies that aim to ensure suitable and sustainable management of local sanitation. The strategic goal to develop technologies within the field of wastewater treatment is aligned with the 6th UN Suitable Development Goal “*Ensure Availability and Sustainable Management of Water and Sanitation for All*”, specifically sub-division target goal 6.3, which states “By 2030, improve water quality by reducing pollution, eliminating dumping and minimizing release of hazardous chemicals and materials, halving the proportion of untreated wastewater and substantially increasing recycling and safe reuse globally” (United Nations , 2022).

KISR research strategy aims to create an active portfolio of medium to high technology readiness-scale of wastewater treatment technologies, including improved of effluent treatment and process water management for zero discharge nature that adds both a research and development value for sustainable Health, Safety and Environment (HSE) Management for both Industrial and domestic wastewater management and water reuse.

The proposed technology will be part of the portfolio, as it will build a novel design and process of a wastewater treatment system integrated with a solar still and an anaerobic biological treatment and membrane filtration (AnMBR) system. Within the project, the pilot-scale system is expected to develop an optimized design, and process, proven by functionality data and results. As such, this technical proof of concept of the proposed technology will support further research and investment in R&D in the field.

The IP Protection Strategy Review

The Commercialization Division prepared an IP landscape report¹, and a prior art search report was prepared by NGM. The invention was reviewed in terms of novelty and non-obviousness, and was recommended to be protected as patent, as it met the patenting criteria (attached reports). Furthermore, the patent and market landscape showed a positive overall trend for similar technologies.

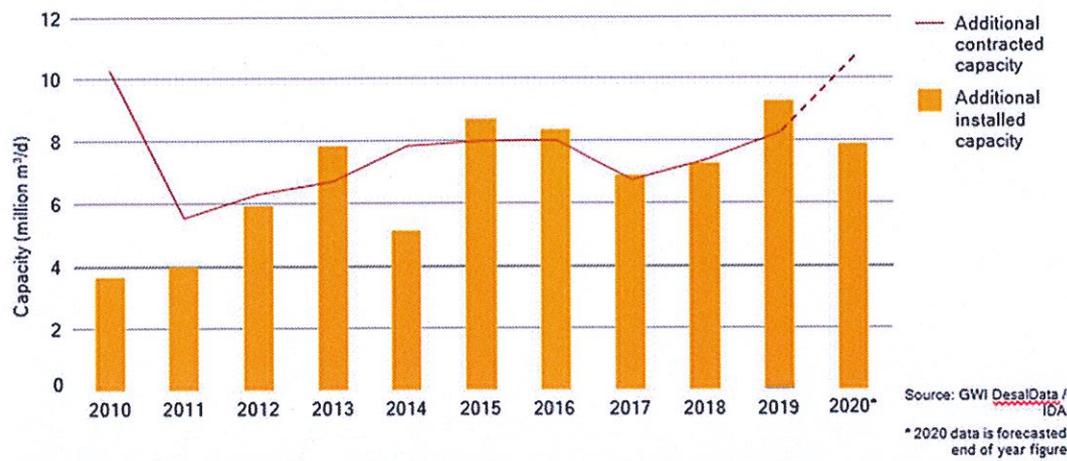
KISR IP Committee reviewed the invention, and recommended to file a provisional patent application, as it showed novelty and good commercial potential. , pending the validation of the design and process via the results of the project, which will provide both functionality data and results, as well as improvements on the applications and patent application claims (i.e., improving the strength of the patent protection).

The Commercial Strategy Review

A quick review of the market landscape showed active and growing demand for wastewater treatment technologies, including anaerobic biological treatment and membrane filtration (AnMBR) systems. The current market size is estimated to be USD 3.0 billion in 2020 and is projected to reach USD 4.2 billion by 2024, at a CAGR of 7.0% (GWI, 2020). There are also major infrastructural investments in improvement of capital structures within the wastewater treatments that relay on improvement in energy usage and improvement in water reuse or improvement of water quality discharge. According to the GWI (2020), the annual contracted and installed reuse capacities are on the rise, with a deep in 2020, due to Covid19.

¹ A report that covers prior art search of related publications, and patents, along with a patent and market landscape.

Annual contracted and installed reuse capacity by year, 2010–2020



Cumulative contracted and installed reuse capacity by year, 1990–2020

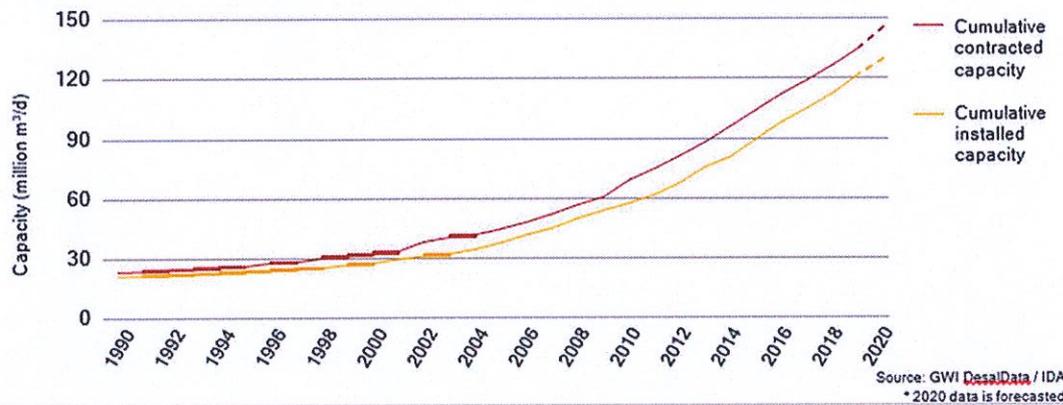


Figure (1) Global contracted and installed reuse capacity 1990-2020 (GWI, 2020)

Furthermore, the review identified potential future investors with interest in the upscaling and commercial implementation of technologies similar to the proposed invention, including Aquatech International Corporation, Evoqua Water Technologies LLC, GE Water & Process Technologies, Koch Membrane Systems Inc., Kubota Corporation, Suez, and Veolia Water. To mention, these potential future investors have both an active R&D, and commercial products and services in the field.

With the market information review, the commercial strategy conclude that the invention has a prospect demand in the market, which suggest that the technology can be licensed to different companies. However, there is a limitation due to the current unavailability of the technical assessment of the pilot-scale system.

Recommendation:

The Commercaillization Division (CD) review of the technology suggests that the IP will be an added value to KISR’s wastewater treatment technology protofilio. The proposed project is ulitmantely needed to strenghthen the concept framing and theory, which will strenghthen the IP and its claims as well as increasing the readiness level of the technology for implementation or transfer, hence increasing the IP value. Thus, the CD recommends approval of the proposed project in support of R&D of technologies with prospect commercial implmentation.