

Danish Aerospace

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COMPANY ANNOUNCEMENT

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Danish Aerospace Company A/S has received support on ESA co-funding developing a full prototype of a Water Recovery System (WRU) for space and disaster zones.

Furthermore, the expectations for this year are scaled down.

This company announcement contains inside information.

Danish Aerospace Company A/S (DAC) has received support on ESA co-funding from ESA's GSTP program (General Support Technology Program) for developing a full prototype of a future water purification system for space. The purpose of ESA's GSTP program is to support the general space related technology developments within the ESA member states. DAC has for some time worked on finance opportunities for further development of the WRU activities. The GSTP support means that the activities now are expected to start in the beginning of 2022.

DAC has not lost any expected contracts in 2021, however, some have been postponed. As a result, the previously announced expectations are scaled down for this year.

DAC and ASA (Aquaporin Space Alliance ApS) have previously had contracts with ESA regarding development of specific key technologies for such a water purification system. It is these key technologies which will now be developed further and integrated into a full-scale prototype to be tested in the laboratory.

- Danish Aerospace Company (DAC) and its joint venture Aquaporin Space Alliance ApS (ASA) will now integrate the technologies into a fully operational prototype of a new water purifying system for space called WRU – Water Recovery Unit.
- DAC has received support for the application under ESA's GSTP technology program with the title "Water Recovery Unit (WRU) – Turning urine and condensate into drinking water for space and on ground".
- The WRU system will recycle urine from astronauts and the humidity which is collected from the atmosphere in the spacecrafts and space stations, so the expensive launches of water for astronauts in space can be reduced.

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- The WRU system includes, among others, Aquaporin A/S' unique Aquaporin Inside™- membrane technology which utilizes aquaporin-molecules to transport water through the membrane. Aquaporins are nature's own water purifier. They quickly enhance a very selective water transport which is found in e.g., plant roots and the human kidney.
- The Danish Agency for higher education and science has, along with the Innovation fund evaluated DAC's application and chose to prioritize it in 2021 from the Danish side.
- The Danish Agency for Higher Education and Science has requested ESA to prioritize funding for the WRU project. DAC must now prepare the final proposal and sign the contract for these development activities with ESA.
- The work can lead to a new type of compact water purifying system, which in the future may be tested on the International Space Station with the possibility of subsequently being used on human flights to the Moon e.g., on the future space station orbiting the Moon, Lunar Gateway.
- Further, the WRU technology has potential within water purification in remote or isolated communities as well as for use within military and disaster relief areas.
- The future contract is expected to run for 12-14 months after signing and has a total value of approximately EUR 700t or about DKK 5,2M.

- As mentioned above, some of the expected contracts have been postponed from this year to 2022 and therefor DAC now expects a turnover just below the previously announced level of DKK 22-25M, and an EBITDA of around DKK 2M (Previously expected DKK 3-5M).

"We are very pleased that The Danish Agency for Higher Education and Science also can see the potential in this technology and supports the WRU project with ESA. It may turn out to have an enormous potential, not just within the space industry but also within a variety of more down-to-Earth applications e.g., disaster relief areas. A fully operational system will prove the feasibility of purification and water recovery from human wastewater under extreme circumstances. This may come to be a tool to fight water shortage in remote areas especially where we find extreme heat e.g., dry, sunny areas. Furthermore, it will assist clearing the way for upscaling the technique which can also be used within industrial areas. Moreover, it helps reduce the volume of wastewater and save water resources by recycling the water that is recovered during the process." says Thomas A. E. Andersen, CEO of DAC and ASA.

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He continues: *“This is yet another key technology area where DAC is focusing on the coming years, in addition to our exercise-, health monitoring- and wearables technologies. We have determinedly worked towards this over the past few years, and it is a key part of our long-term strategy.”*

Additional information

Aquaporin Space Alliance ApS (ASA) is a 50/50 joint-venture between DAC and Aquaporin A/S. ASA has the exclusive rights to utilize Aquaporin's unique patented technology in space. The WRU system will be based on an open loop triple circulation system with a two-stage filtration.

Water is an extremely scarce resource in space. The astronauts on the space station clean themselves with less than a 10th of the water people on earth typically use. Usually, an astronaut uses about 4-6 liters of water pr. day for drinking, hygiene, and cleaning etc. in space, while we on Earth use between 60-150 liters per day. In 2015 Danes on average used 106 liters of water per day. In space, different types of water, such as, condensed water from the humidity in the cabin, urine from the astronauts and wastewater from the lavatories and cleaning are re-usable.

Launches og supplies from Earth to the space station are normally valued at approximately \$50.000 (DKK 350.000) per kilo, so any amount of water, which can be re-used with a simplified and reliable system, will give a direct and significant cost saving for the human exploration of space.

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About Danish Aerospace Company A/S:

Danish Aerospace Company (DAC) is a high-tech company operating in the area of advanced medical instrumentation and other engineering fields primarily within space applications.

Our products are based on many years of specialized research and development. These consist of developing, integrating, and applying new as well as established medical technologies to the challenges of functioning and remaining reliable in space. These products and services bring the potential of space research and experience from space operations down to Earth for the benefit of all mankind.

Danish Aerospace Company employs engineers and technicians who deliver full engineering, production and technical services for our customers. We have specialized in customer specific design, development, manufacturing, certification, maintenance, testing, and operations.

The company has developed five generations respiratory equipment for spaceflight, ergometers for astronauts, countermeasures, adapted several commercial medical equipment for spaceflight and has participated in the development of the minus eighty-degree Celsius freezers.

The Company's quality system is certified in obligation to BS EN ISO 9001:2015, BS EN 9100:2018 technical equivalent to AS9100D that is the acknowledged standard in the area.

Note: *This is a translation of the corresponding Company Announcement in Danish. In case of discrepancies between the Danish wording and the English translation, the Danish wording prevails.*

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