Go2Gov
Connecting startups to Government

How can we develop a highly accurate depth to water measurement tool?

Challenge summary

The Department for Environment and Water (DEW) is the lead agency for water monitoring in South Australia. The DEW water resources monitoring team collects data from approximately 3,645 different groundwater and 245 surface water sites across the state. Through this Challenge, DEW is seeking to work with local startup(s) to develop a substitution/alternative to current methods for measuring 'depth to water', which currently relies on pressure sensor probes suspended in the water column via a cable connected to a logger at the surface.

Overview of the Challenge

Monitoring depth to water is vital to understanding and sustainably managing the quantity of groundwater within an aquifer. The depth changes depending on the time of year, rainfall, and the amount of groundwater being accessed by users. This data is highly valuable in determining seasonal variations and any long-term trends. Additional interpretive products can be created, such as hydrographs, water level surface maps and groundwater models.

To determine and monitor the quantity of groundwater resources, DEW officers are required to measure the depth to water by measuring the distance from a reference point on the surface to the top of the water table within boreholes. The diameter of these boreholes is between 50-250mm and extend to around 50m in subsurface depth. Pressure sensor probes are suspended in the water column via a capable that's connect to a logger on the surface. This cable can nominally cost around $20+ per meter.

The challenge is to simplify the deployment of sensors in bore holes without the requirement for excessive cables lengths.

Solution Requirements

Alternative methods to replace the cable with lower cost options such as radar, laser, and ultrasonic technologies have not proven to be successful/reliable due to the specific characteristics of deep boreholes, which includes:

- Narrow bore diameters 50-250mm, which are not perfectly straight which can interfere/reflect laser beam and compromising the accuracy
- Other options require a direct line of sight from surface to the water level and therefore cannot be used as boreholes are not always straight
- The highly humid environment of the borehole scatters or absorbs laser beams and provides unreliable readings

- The boreholes are in remote locations and therefore are required to operate from battery power for 6-12 months taking around 4 readings per day. Alternative sources of power will be highly regarded
- The final solution requires a low-cost solution to be commercially viable.

It is envisaged that a functioning solution will have broader applications, i.e. in the mining sector.

Commercial benefits of the solution

Having a suitable solution will create practical and operational benefits to DEW by:

- Eliminating the high cost of instrumentation cable use as is the current practice
- Simplifying the deployment of pressure sensors within boreholes, reducing cost
- Providing greater capacity for the deployment of sensors to collect field data in real time across a wider range of sites, due to cost effectiveness compared to current practice with manual or telemetered systems

Further information

A Q&A session will be held where further information can be obtained directly from the DEW Challenge Owner and the Go2Gov Program Manager. To register your interest for this session and if you have any further questions regarding this Challenge, please contact the Program Manager at DIS.SmartProcure@sa.gov.au.

How to apply

For information on the eligibility criteria and how to apply, visit www.fixe.org.au