Deep sea pipelines to green gas production

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(PhysOrg.com) -- University of Queensland researchers are working to tap into a wealth of natural gas resources located in distant, deep-ocean fields off the coast of Western Australia.

Civil engineers Dr Faris Albermani and Dr Tom Baldock are working as part of the CSIRO Wealth from Oceans Flagship's Subsea Pipeline Collaboration Cluster to safely and economically design and operate subsea pipelines in Australia's deepwater frontiers.

Stretching hundreds of kilometres long and positioned in waters of almost a kilometre deep, the ultra-long pipelines will carry oil and gas from the remote reserves directly to the shore.

Dr Albermani said the subsea pipelines would enable us to tap into previously unattainable natural gas resources situated off Australia's continental shelf.

“Australia has recently expanded its area of offshore exploration and geologists believe there are lots of gas and oil resources in deep-sea fields to sustain the country for a long time.

“The new pipelines will transport oil and gas directly from subsea wells to the shore without the need for production platforms.”

The major challenge of their work is designing stable pipelines which will withstand decades of strong currents, a shifting seabed and steep seabed slopes.

Dr Albermani's research will be vital in ensuring the structural reliability of the pipeline in the deep-water environment.

“A rupture in the pipeline could cost millions of dollars and potentially leak gas and oil into the environment,” Dr Albermani said.

“Our research will investigate the effects of buckling on these ultra-long pipes and ways in which we can stop it from spreading through and damaging the pipeline.”

The researchers will also be looking at the safe routing of the pipeline as it travels up from very deep water through submarine canyons and soft soil and onto the continental shelf.

“We already know that this technology works, now we have to adapt it to make it suitable for these unpredictable deepwater conditions,” Dr Baldock said.

“We need to know what protection the pipes require from hazards such as tsunamis which may trigger submarine landslides and seabed erosion.”

UQ is one of six universities taking part in the Subsea Pipeline Collaboration Cluster through CSIRO's Wealth from Oceans Flagship. The group is led by The University of Western Australia and also involves Monash University, The University of Sydney, Curtin University of Technology and Flinders University.

Source: University of Queensland