

## Technology Collaboration Center Collaboration Request

### REQUEST SUMMARY

Collaboration Request ID: IHRT

Collaboration Request Title: Improved Hydrocarbon Recovery Technologies

Requesting Organization: Shell GameChanger

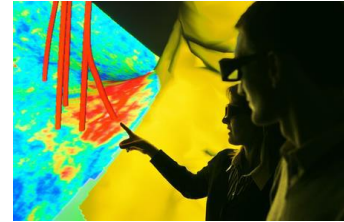
All questions on this request are to be submitted via e-mail to [Collaborations@techcollaboration.center](mailto:Collaborations@techcollaboration.center)

Any organizations interested in participating in this collaboration are to submit a proposal using the Collaboration Response form from [techcollaboration.center](http://techcollaboration.center), the Technology Collaboration Center's (TCC) website. Responses will be forwarded to the Requesting Organization for consideration.

## DETAILS – NON-CONFIDENTIAL

### **CONTEXT:**

Reservoir targets are becoming increasingly difficult to find and develop. Many current and future developments involve complex improved oil recovery (IOR) and enhanced oil recovery (EOR) projects, challenging fluids (heavy oil, sour gas), challenging reservoirs (tight formations, deep reservoirs, high temperature and pressure), or challenging environmental settings including deepwater locations.



Improved understanding of the architecture of reservoirs and detection of hydrocarbons within them reduces development risk and increases ultimate recovery. Imaging the earth's substructure is currently hampered by the increased focus on complex stratigraphic and structural traps, and tight carbonate and shale plays and on smaller near-field accumulations with high level of uncertainty of detection, resolution and depth conversion.

Affordable technology will play a pivotal role to meet demand in the current business environment.

Global average field recovery from water flooding is currently around 35%, leaving between 60 to 70% of oil in place, this represents a substantial opportunity for enhanced oil recovery. When optimised from the start, it leads to reduced facility sizing, faster production and lower unit costs, combined with higher value and volume. However, with the increased complexity of new and mature fields, improving recovery comes with increased cost. Operational excellence in primary and waterflood stages of field development is required for implementation of improved oil recovery technologies, and cost-effective reservoir monitoring is essential to make well-informed field development decisions, to mitigate project risk and meet production targets.

### **WHAT WE ARE LOOKING FOR:**

We seek novel technologies and systems to improve reservoir management and maximize recovery. This includes real-time subsurface sensing and control for oilfield operations providing us with the ability to track reservoir sweep and well performance in real time for proactive decision making. The use cases may encompass high-grading new plays, cost effective and rapid near-field exploration, improved recovery from producing assets, and reduced footprint. Marine applications are focused on low-cost, on-demand seismic monitoring using seafloor sensors and in-well distributed acoustic sensing (DAS) fiber optics. Onshore development focuses on low-cost areal seismic monitoring options using conventional equipment and emerging DAS fiber optics systems.

The proposals must be capable of addressing specific oil and gas industry issues and should include a clear description of the business case. The basic science must be well understood, but the concept would still need to be proven through modeling or testing in a simulated operational environment.

Typically, technologies with a TRL 3 (as per [API 17N](#)) or lower are the best candidates for this call. Please provide a clear description on how you will reach your "Proof of Concept".

**IN SCOPE:**

- Remote and aerial surveillance technologies
- Monitoring and tracking of reservoir tracers or agents
- Novel technologies for stimulation and for managing sweep
- Next generation downhole systems which include monitoring, control, and power harvesting.

**OUT OF SCOPE:**

- Conventional 3D seismic technologies and interpretation
- Reservoir simulation-based methods
- Established water flooding or chemical/thermal EOR methods

**WE APPLY THE FOLLOWING CRITERIA FOR CONSIDERATION:**

- Novelty – Is the idea fundamentally different and unproven?
- Valuable – Could the idea create substantial new value if it works?
- Doable – Is there a plan to prove the concept quickly and affordably?
- Relevant (Why Shell?) – Is the idea relevant to the future of energy?

Any information submitted as part of the process must contain only NON CONFIDENTIAL data and information at this stage.

The funding opportunity will be in the range USD 150,000 - 300,000 to progress a “proof of concept” in a phased approach over a period of no more than 12 months. Further development may be supported and or facilitated by Shell depending on the overall outcome of the initial award.