

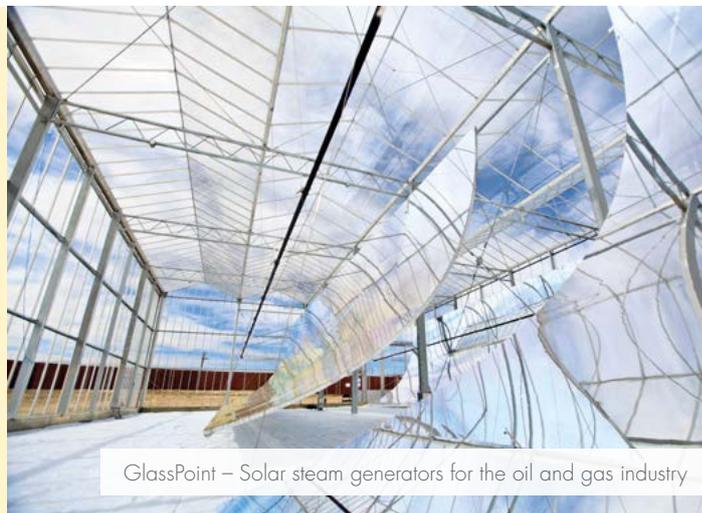
# Oil and Gas



## Call for safety, sustainability, and carbon footprint reduction

### CONTEXT

Greenhouse-gas emissions from the energy sector represent roughly two-thirds of all anthropogenic greenhouse-gas emissions and CO<sub>2</sub> emissions from the sector have risen over the past century to ever higher levels<sup>1</sup>. In Shell we have made progress in our environmental performance: by end of 2015 spills were reduced by around 30% while our total greenhouse gas emissions decreased. We are also making headway to end continuous flaring by 2030, which helps to reduce our methane and carbon dioxide (CO<sub>2</sub>) emissions<sup>2</sup>.



GlassPoint – Solar steam generators for the oil and gas industry

### WHAT WE ARE LOOKING FOR

We continue to seek competitive, environmentally responsible technologies and systems that will help minimize the carbon footprint greenhouse gas impact of oil and gas operations as well as novel inspection solutions that can autonomously image identify, quantify, and repair leaks and emissions.

Multiple types of emissions must be addressed if we want to effectively reduce the impact of climate change. More specifically, we seek to reduce the following emissions:

- **Hazardous Air Pollutants, which can cause serious health problems**
  - Benzene, toluene, xylene, formaldehyde
  - Ethyl-benzene, n-hexane
- **Criteria Pollutants, which cause damage to health and welfare**
  - Carbon monoxide, sulfur dioxide, ozone, nitrogen oxides
- **Volatile Organic Compounds, which contribute to ozone formation**
  - Hydrocarbon compounds excluding methane and ethane
- **Greenhouse Gases, which contribute to climate change**
  - Carbon dioxide, methane, nitrous oxide

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 could still need to be proven through modeling or testing in a simulated operational environment.

Typically, technologies with a TRL 2-5 (as per [API 17N](#)) are the best candidates for this call. Please provide a clear description on how you will reach your “Proof of Concept”.

1 Energy and Climate Change, IEA 2015: <https://www.iea.org/publications/freepublications/publication/WEO2015SpecialReportonEnergyandClimateChange.pdf>

2 Shell Sustainability Report 2015: <http://reports.shell.com/sustainability-report/2015/servicepages/download-centre.html>

### IN SCOPE

- Technologies that enable drastically reduced-emissions in oil and gas operations including drilling, completion, and production.
- Compact facilities and integration of new energies in oilfield operations.
- Unmanned aerial surveillance vehicles (UAS).
- Microsat/cubesat-based hyperspectral imaging technologies.
- Other autonomous means of imaging and quantifying methane emissions.

### OUT OF SCOPE

- Hand-held devices or sampling bags.
- Manual or semi-manual processes.

### WE APPLY THE FOLLOWING CRITERIA FOR CONSIDERATION:

1. Novel – Is the idea fundamentally different and unproven?
2. Valuable – Could the idea create substantial new value if it works?
3. Doable – Is there a plan to prove the concept quickly and affordably?
4. 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.

For questions contact [GameChanger-Challenge@shell.com](mailto:GameChanger-Challenge@shell.com)