

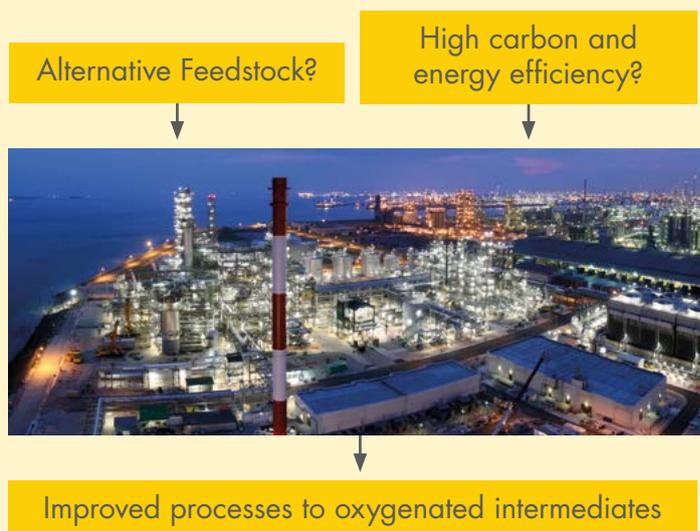
# New Energies

## New Routes to Oxygenated Intermediates



### CONTEXT

The bulk chemical industry produces a wide range of oxygenated intermediates, such as alcohols, aldehydes and esters, which are then used in e.g. polymer production. Many conventional routes for commercial production of oxygenated chemical intermediates are currently based on olefins produced by steam cracking of naphtha or light paraffins. There is a lot of ongoing activity to investigate routes based on alternative feedstocks, such as natural gas and biomass. Downward pressure on CO<sub>2</sub> footprint leads to increased incentive for high carbon efficiency of processes, on a cradle-to-gate basis. The decreasing cost of electricity can also be an enabler for novel processing concepts. Additionally, advances in materials science can enable the production of improved catalytic systems. The challenge in developing new routes to established intermediates is that the existing routes are mature and hence far along their experience/cost curves. New routes must therefore have significant carbon/energy advantages in order to displace them.



### WHAT WE ARE LOOKING FOR

We seek proposals that can demonstrate and bring to 'proof of concept' novel routes to oxygenated intermediates which have the potential to supplant existing commercially applied processes, based on superior carbon and energy efficiency.

### TOPICS OF INTEREST

- Novel routes to alcohols, esters or aldehydes which are currently produced in bulk by the chemical industry.

### TOPICS NOT OF INTEREST

- Improvements to existing processes, e.g. solely novel catalyst or novel unit operation in existing process.

Ideal proposals are from early-stage companies already working to de-risk the technology and the business model. The GameChanger program can offer non-dilutive pre-seed/seed funding, subject matter expertise, and connections to assist with industry understanding and uptake.

If your company offers a technology that fits these characteristics but is deemed too mature or proven, we will still evaluate it, and where appropriate, will expose the technology at Shell for replication.

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".

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

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

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)