

Call for Applicants: Energy System Modeling Partner for SUNGATE Project

Submission Deadline: March 14th, 2025, at 12:00 CET

For inquiries, contact aspa@demx.dk.

Introduction

Democracy x, on behalf of the SUNGATE Horizon Europe project, is currently looking to contract a foresight-based energy model contractor for a hotspot analysis for the potential of utilizing photoelectrochemical cell (PEC) in Europe.

The contractor should develop a model looking at potential areas for capacity for future solar to fuels production for methanol, based on resource availability and geographical overlap in these resources. e.g. where exactly and how much is there geographical and resource amount overlap in f.ex CO2 point sources, fresh water availability, sunlight and land area to install the PEC's, and methanol buyers (f.ex. ships/chemical industry, though less geographically important). Figure out how much solar fuel could be produced in Europe given current future forecasts for these resources. Especially with regards to CO2 availability that doesn't come from fossil sources. Use assumptions about general yield data from the project to estimate land area sizes and actual CO2 availability. This report would need to be published publicly by the subcontractor, and include both hard data for the model (excel spreadsheet and GIS analysis) as well as qualitative reporting. Some more assumptions need to be made with regards to effective distance which CO2 can be transported to make energetic sense. The analysis should also include EROI (energy return on investment) to make sure that the proposed systems are energy favorable (i.e. transport doesn't use too much energy)

Task description

The SUNGATE administration is envisioning a two-part involvement of the energy system modeling partner. Should the applicant choose to include additional parts to the involvement, they are free to do so. However, there is no guarantee that these will be considered. These efforts are to be part of a technical assessment report of the environmental, societal, and ethical aspects of the SUNGATE Technology.

Please describe how your organization will approach and complete each of these tasks.

Task 1 – Hotspot analysis **The deadline for submission of the report is September 30th, 2025.**

Conduct a foresight-based energy model hotspot analysis for PEC technology, particularly SUNGATE's application. Use resource forecasts and yield data to assess potential production capacity across Europe.

The analysis should include:

- Geographical overlaps of CO2 availability (both fossil and non-fossil sources), freshwater, sunlight, and suitable land.
- Practical estimates of solar fuel production capacity.
- Assumptions about effective CO2 transport distances and energy efficiency.

Task 2 – Stakeholder workshop - **Timeline: Date TBD between October 1–December 15, 2025**

The second task is to be part of an online workshop for future insights on energy needs and product potential with the purpose of evaluating the SUNGATE technology. The workshop bringing together energy experts (e.g., energy modellers, researchers, and key industry stakeholders) to provide insights into future energy needs, estimations and recommendations for successful market penetration. The



applicant should be able to contribute with a presentation of the hotspot analysis, as well as contribute to an outline of useful outputs from the workshop that can add to the insights of the hotspot analysis.

Instructions for applicants

Applicants are responsible for ensuring that their application is complete and accurate, and that the prices quoted are arithmetically correct for the items and units quoted. The application must be written in English.

Prices must be given in EURO (€), be exclusive of VAT
The price must not exceed 20.000 €.

Applications must be received by the March 14th, 2025 at 12:00.

All relevant documents must be in PDF format and attached to a single e-mail (35MB max) and sent to aspa@demx.dk. Applications that exceed this deadline will not be considered, unless adequate evidence can be provided that prove the delay was out of the applicant's control. Any questions about the application should be directed to aspa@demx.dk.

The deadline for clarifying questions is March 7th, 2025.

Selection of the application

The application will be selected based on an overall assessment of prioritized functionalities combined with cost. The SUNGATE project is under no obligation to accept the lowest bid.

All applicants will be notified of the decision on the 21st of March 2025.

The contracting entity is:

Name: Fonden Democracy x

Tax number: DK34577358,

Address: Sorøgade 6, 3-4 floor, 2100 Copenhagen. Denmark

The contracting entity will sign an assignment contract with the winning applicant after closing the application process.

The contracting entity reserves the right to reject all applications, and thus declaring the application process unsuccessful if none of the submitted applications fulfils requirements or is unbeneficial to it, without any justification. If the offer of an application contains unreasonably low pricing, the contracting entity is entitled to request further details or justification from the applicant. The contracting entity reserves the right not to accept an offer if it cannot be accepted or can be considered as irrational from an economic point of view.

The contracting entity may initiate a negotiation process with the winning applicant if some parts of the application need further clarification. In case the winning applicant withdraws from the process the contracting entity reserves the right to start negotiations with the second-best offer and sign the contract with its owner. In case the contract cannot be signed with the winning applicant within 15 days after the announcement of the winner due to reasons arising at the applicant's side, the contracting entity reserves the right to enter into negotiations with the second-best offer and sign the contract with its owner.

The applicants understand that announcement of the winner of the application process does not automatically initiate a contractual relationship between the contracting entity and the winning applicant, it is only established by signing the contract.

