

MEMORANDUM OF UNDERSTANDING

Between

The National Renewable Energy Laboratory

And

Nederlandse Organisatie voor toegepast-natuurwetenschappelijk Onderzoek

For coordination on energy systems facilities and configurations

INTRODUCTION

The National Renewable Energy Laboratory (NREL), a national laboratory managed and operated by the Alliance for Sustainable Energy, LLC for the United States Department of Energy (DOE) under Contract No. DE-AC36-08GO28308, has a facility at 15013 Denver West Parkway, Golden, CO 80401.

The Nederlandse Organisatie voor toegepast-natuurwetenschappelijk Onderzoek (TNO), is a legal entity by public law, duly organised and existing under the laws of the Netherlands and with registered offices at Anna van Buerenplein 1, 2595 DA Den Haag, the Netherlands legally represented by René Hooiveld, director Sustainable Energy acting in full capacity on behalf of the Board of Management of TNO.

Integral to its mission for DOE, NREL conducts research and development to enhance energy efficiency and the production of renewable energy to bring clean, reliable and affordable energy technologies to the marketplace. NREL has active programs in solar energy, wind energy, ocean energy, biomass energy, geothermal energy, utility integration, transportation systems, energy efficiency, and energy analysis and applications. DOE achieves its program objectives through federally-funded research and development at NREL in each of the above-listed areas.

TNO is an independent research organization striving through its expertise and research to make an important contribution to governments and industry, to the economy and to the quality of society as a whole. TNO conducts research and development to enhance the integration of renewable energy in the energy grid, to develop and valorize CO2 neutral and clean energy technologies in the market place. TNO has unique expertise and certain intellectual property rights in the field of (renewable and fossil) energy, has developed various new software and tools and has available a Hybrid Energy System Integration facility. TNO has active programs in place in the fields of solar and wind energy, bio-energy, geothermal energy, ocean energy, oil & gas, energy infrastructures and digitalization of energy systems, energy efficiency, electrification of the industry, energy markets and energy policy and analysis.

NREL or TNO is each referred to as a “Participant.” Both NREL and TNO are collectively referred to as “Participants.”

The purpose of this MOU is to encourage coordination in areas of mutual interest and benefit to both Participants. Based on the principles of equality and reciprocity, this MOU is intended to serve as a general framework for planning coordination between the two Participants and is intended to facilitate discussions for the development of a more specific planned program of

research and development collaboration. Any specific program of collaboration or sharing of confidential information is to be implemented through an appropriate written contract between the Participants.

Section 1: Scope of Coordination

The coordination activities planned, and the programs of collaboration contemplated in furtherance of, under this MOU are focused on cooperation to maximize the benefit to their respective institutional interests, which may include the following selected topics:

- Increased understanding of innovations in technological and virtual energy infrastructure. Coordination on the positioning of the virtual link between NREL's ESI (Energy System Integration) facility and TNO's HESI (Hybrid Energy System Integration) facility in a way that this link may become the backbone of a North American and European collaboration in which both facilities endeavor to become a virtual hub by connecting the facilities of their regional partners.
- Increased understanding of energy system integration in Europe and the United States. Coordination on the selection and creation of innovative energy system configurations for power, heat and gas networks, which are reliable, affordable and can be integrated within the current existing energy system infrastructure in North America and/or Europe.
- Increased understanding of the International Institute for Energy Systems Integration (iiESI). Coordination on TNO's possible membership in the iiESI, a global membership-based organization comprised of leading researchers, educators, and practitioners working to define and advance the emerging field of Energy Systems Integration (ESI).

Coordination activities planned under this MOU and collaboration activities in furtherance of this MOU are envisioned by the Participants to enable them to coordinate:

- a. research agendas globally,
- b. local expertise of the energy system context in each Participant's location,
- c. utilization of available functionalities of each of the Participants' facilities to the fullest potential.

Section 2: Forms of Coordination

Planned coordination under this MOU may include:

1. Exchange of published scientific and technical information, publications, and reports;
2. Meetings organized to discuss specific topics identified in Section 1, including conferences, seminars, and workshops;
3. Exchange of scientists, engineers, and other specialists for participation in workshops, conferences, seminars, working sessions, and model-development activities. Each Participant is to abide by the health, safety, and environmental requirements of the host Participant when on an exchange assignment at the host Participant's facility.

Section 3: Funding

1. The scope of coordination activities under this MOU should be mutually determined in light of time, resources and/or funds available at both institutions for the types of coordination undertaken and by such other financial assistance as may be obtained by either Participant from external sources.

2. Unless the Participants otherwise determine in a separate written agreement, each Participant is to be responsible for the costs it incurs in participating in the coordination contemplated by this MOU, including all administrative costs, overhead expenses, labor costs, insurance costs, travel expenses and similar costs.

Section 4: Researcher Exchanges

1. Each Participant retains responsibility for its own personnel in relation to researcher exchanges to carry out coordination under this MOU.
2. Each Participant's personnel is to abide by the regulations, policies, and procedures of the host Participant in carrying out activities under this MOU, including protection of business proprietary information, protection of intellectual property, conditions of coordination and decorum, health, safety, and security requirements, and all other terms under which personnel are authorized to participate in researcher exchanges at the host Participant's facility. Such activities may require entry into separate written agreements.
3. Each Participant is to be solely responsible for its own personnel in relation to matters such as visa and travel formalities, appropriate insurance (medical insurance and medical evacuation and repatriation insurance), travel expenses, and suitable living accommodation and expenses.
4. To the extent possible, the host Participant should assist in facilitating travel arrangements of the other Participant's personnel in relation to researcher exchanges in accordance with its applicable procedures governing foreign national access to the host Participant's facility.

Section 5: Dissemination of Information

Each Participant intends to participate in the coordination in a manner that facilitates exchanges of publicly available, non-proprietary business information. Subject to applicable laws and regulations of its country, each Participant may disseminate information, data, and reports of the coordination carried out under this MOU.

Section 6: Use of Information

Any information transmitted by one Participant to the other Participant under this MOU should be accurate to the best knowledge and belief of the transmitting Participant.

Section 7: Intellectual Property

The Participants do not anticipate the transfer of rights in intellectual property or the sharing of confidential information to occur under any planned coordination activity under this MOU.

Section 8: Future Collaborations

Any specific future research and development collaboration or the transfer or commitment of funds is to be implemented through an appropriate written contract between the Participants. Any such contract should include a work plan, staffing requirements, cost estimates, funding sources, the adequate and effective protection and allocation of intellectual property rights, and other arrangements or conditions; and must be authorized under NREL's Management and Operating Contract.

Section 9: Review of Coordination

The Participants intend to review the coordination undertaken under this MOU as a means to ascertain its effectiveness, document achievements and lessons learned, recognize technical personnel, and identify and plan areas for potential future collaboration that involves the conduct of research and development. This review should take the form of periodic meetings of representatives of each Participant to discuss ongoing coordination and to identify and plan future collaboration that involves the conduct of research and development activities.

Section 10: Contacts

One or more designated representatives from each Participant should oversee, manage and facilitate implementation of this MOU in cooperation with each other on behalf of their respective institutions. All notices, communications and coordination should involve, at a minimum, the following individuals, their successors and/or designees as follows:

- (a) For the National Renewable Energy Laboratory:

Sarah Truitt
15013 Denver West Parkway
Golden, CO 80401
Tel: +1 303.275.4684
Sarah.truitt@nrel.gov

- (b) For the Netherlands Organisation for applied scientific research (TNO):

René Hooiveld
Anna van Buerenplein 1
2595 DA Den Haag
The Netherlands
Tel: +31 88 866 28 15
Email: rene.hooiveld@tno.nl

Section 11: General Considerations

1. This MOU is not intended to create any legally binding obligations between the Participants.
2. Each Participant should conduct the coordination contemplated by this MOU in accordance with applicable laws and regulations to which it is subject and international agreements to which its government is party.

Section 12: Commencement, Modification and Discontinuation

1. Coordination under this MOU may commence upon signature, and may continue for a period of two (2) years, unless discontinued in accordance with paragraph 3 of this section.
2. The Participants may modify this MOU at any time by mutual consent in writing.
3. The Participants may discontinue coordination under this MOU at any time by mutual consent in writing. Alternatively, a Participant that desires to discontinue its participation in this MOU should endeavor to provide the other Participant at least 90 days advance written notice.

Signed in duplicate.

For
National Renewable Energy Laboratory



Bryan Hannegan
Associate Lab Director-Energy Systems
Integration

31/1/17
Date

Groningen, The Netherlands
Place

For
Nederlandse Organisatie voor toegepast-
natuurwetenschappelijk Onderzoek TNO



Rene Hooiveld
Director Sustainable Energy

31.06.17
Date

Groningen, The Netherlands
Place

SUBJECT TO U.S. DEPARTMENT OF ENERGY APPROVAL