Short Term Forecasting
Funding Announcement Information Session

9 April 2018

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Agenda

1. Introduction and strategic context
2. Application and assessment process
3. Open Q&A
Australian Renewable Energy Agency

Purpose:
Accelerate Australia’s shift to a sustainable, affordable and reliable energy future

Portfolio:
$1.14 billion funding committed to support over 364 projects
172 completed projects
+161 active projects (incl scholarships, fellowships)

Pipeline:
$553m funding available to support innovative energy technologies
+75 active projects in our pipeline

Knowledge Sharing |
Collect, analyse, interpret and disseminate
INVESTMENT PRIORITIES

DELIVERING SECURE AND RELIABLE ELECTRICITY

ACCELERATING SOLAR PV INNOVATION

IMPROVING ENERGY PRODUCTIVITY

EXPORTING RENEWABLE ENERGY
Delivering Secure and Reliable Electricity

‘Investing in new ways to use, store, manage and share renewable energy to provide secure and reliable electricity’

- Renewable energy resources integration (e.g. DER to large-scale)
- Market data and information (e.g. data aggregation, energy system models)
- Power system security (e.g. FCAS from wind farms)
This initiative is a collaboration between ARENA and AEMO

A collaboration between AEMO and ARENA within the Memorandum of Understanding established in May 2017

Jointly progressed in ARENA A-Lab in 2017, and February 2018 workshop

Vision:

- To allow wind and solar generators to submit their own generation forecasts to AEMO for use in market dispatch
- To explore the potential of forecasting technologies to provide accurate site-specific forecasts
There are two key elements of work...

<table>
<thead>
<tr>
<th>1</th>
<th>Build and deploy AEMO IT interface</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>● Design and build the systems to verify and accept participant self-forecasts into AEMO’s dispatch engine.</td>
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</table>

<table>
<thead>
<tr>
<th>2</th>
<th>Build industry capability</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>● Enable a set of proof-of-concept projects implementing reliable self-forecasts into AEMO systems.</td>
</tr>
<tr>
<td></td>
<td>● Encourage a collective effort to improve forecasts for intermittent generators.</td>
</tr>
<tr>
<td></td>
<td>● Involve a mix of forecasting technologies and generator sizes and types.</td>
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</tbody>
</table>

**AEMO-led**

**ARENA-led**
What are the motivations and benefits of this initiative?

<table>
<thead>
<tr>
<th>MOTIVATIONS</th>
<th>BENEFITS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Misalignment of NEM accountabilities</td>
<td>Reduced costs on generator and system</td>
</tr>
<tr>
<td>Financial impacts on renewable generators</td>
<td>Improved system security</td>
</tr>
<tr>
<td>System security challenges</td>
<td>More renewable energy on the system</td>
</tr>
<tr>
<td></td>
<td>Better PPAs</td>
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</tbody>
</table>
What do we want to achieve from this Funding Announcement?

1. Demonstrate the ability for Market Semi-scheduled Generators to submit **five-minute ahead self-forecasts** via AEMO’s web based application programming interface (API).

2. **Demonstrate the ability for self-forecasting to be more accurate** than the equivalent forecast produced by the Australian Wind Energy Forecasting System (AWEFS) or Australian Solar Energy Forecasting System (ASEFS).

3. **Explore the potential commercial benefits** for Market Semi-scheduled Generators of investing in forecasting approaches.

4. **Examine factors that affect the accuracy** of the forecasting approach trialed. e.g. in different weather, operational conditions or geographies.

5. **Improve the commercial and technical readiness** of forecasting providers and technologies.

6. **Contribute to industry knowledge sharing**.
What are we looking for?

Novel technologies, commercial models or demonstration projects that:

- Include at least one Market Semi-scheduled Generator (wind or solar) operating in the NEM wholesale market from July 2018
- can provide 5-minute ahead generation forecasts
- can comply with data standards, as determined by AEMO, in order to integrate into the specified API

Consortiums are welcome

ARENA may also consider different innovative projects that advance approaches to forecasting (e.g. a data science and machine learning competition to test short-term forecasting approaches).
Agenda

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Background

- Proposals are funded through the Advancing Renewables Program, requirements and process is outlined in the Guidelines [https://arena.gov.au/funding/programs/advancing-renewables-program/](https://arena.gov.au/funding/programs/advancing-renewables-program/)


  Select the *Short Term Forecasting Funding Initiative* option
ARENA’s assessment process

<table>
<thead>
<tr>
<th></th>
<th>Two stage process</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Expression of Interest (limited information, less prescriptive/defined)</td>
<td>Full Application (invitation only)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Same process for both stages (Full Application more detailed and firm budget).</td>
</tr>
</tbody>
</table>

|   | Eligibility Criteria                                                             |                                                                 |
| 2 |                                                                                  | Seven eligibility criteria                                       |
|   |                                                                                  | All must be met to proceed to merit assessment                   |

|   | Merit Criteria                                                                   |                                                                 |
| 3 |                                                                                  | Applicants refer to funding announcement for information on how to demonstrate merit |
|   |                                                                                  | All 5 merit criteria equally weighted                             |
|   |                                                                                  | ARENA staff may identify low merit projects and stop assessment process |
|   |                                                                                  | ARENA Advisory Panel will assess remaining applications against merit criteria. |

|   | Portfolio Approach                                                               |                                                                 |
| 4 |                                                                                  | Considers how a project uniquely contributes to the Program objectives, or as part of a suite of complementary ARENA projects |
|   |                                                                                  | May not fund if similar to existing ARENA project or other project under assessment |

|   | Value for money                                                                  |                                                                 |
| 5 |                                                                                  | Applications assessed for overall value for money and risk against the merit criteria |
EOI Assessment: Application and Assessment Process

1 - Two-stage process
# EOI Assessment: Application and Assessment Process

<table>
<thead>
<tr>
<th>Party</th>
<th>EOI Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applicant</td>
<td>Submit EOI → Receive Application → Clarifications → Eligibility Assessment → Provide Ineligible Letter → Notify Applicant → Receive Notification</td>
</tr>
<tr>
<td>ARENA</td>
<td>Receive Application → Eligibility Assessment → Provide Ineligible Letter → Notify Applicant</td>
</tr>
<tr>
<td>Advisory Panel</td>
<td>Merit Assessment</td>
</tr>
<tr>
<td>CEO</td>
<td>Invited to Full Application</td>
</tr>
</tbody>
</table>

## Tools
- ARENA.net
EOI Assessment: Application and Assessment Process

1 - Two-stage process
Full Application: Application and Assessment Process

1 - Two-stage process

**Party**
- Applicant
  - Submit Full Application
- ARENA
  - Receive Application
  - Eligibility Assessment
  - Clarifications
  - Provide Ineligible letter
  - Provide Successful letter
  - Contract negotiation
- Advisory Panel
- CEO
- Tools
  - ARENA Tool

**Full Application Assessment**

- Application and Assessment Process
- Merit Assessment
  - Y
  - Approval
  - N
  - Provide Ineligible letter
  - N
  - Provide Successful letter
  - Notify Applicant
  - Contract negotiation
Full Application: Application and Assessment Process

- **Applicant**
  - Submit Full application
  - Receive Application
  - Eligibility Assessment
  - Clarifications
  - Provide Ineligible letter
  - Notify Applicant
  - Provide Unsuccessful letter
  - Notify Applicant
  - Full Application Assessment

- **ARENA**
  - ARENAnet

- **Advisory Panel**

- **CEO**

- **Tools**

1 - Two-stage process
Full Application: Application and Assessment Process

1 - Two-stage process
## Eligibility Criteria

<table>
<thead>
<tr>
<th>A - eligible applicant</th>
<th>Must be an Australian entity incorporated under the Corporations Act 2001 (Cth) OR be a Commonwealth entity such as a Australian local government or council or Australian State or Territory owned corporation or subsidiary.</th>
</tr>
</thead>
<tbody>
<tr>
<td>B - eligible project</td>
<td>Must involve a “Renewable Energy Technology” as defined in the Guidelines and/or has potential to contribute to the Program Outcomes. Does not include research at TRL 1-3 or the training or education of students unless part of a larger activity focused on a later stage TRL</td>
</tr>
</tbody>
</table>
| C - take place in Australia | Majority of activities must take place in Australia  
No more that 10% of ARENA funds may be spent overseas, with exception of purchase or use of equipment and materials. ARENA will consider requests in increase this cap at EOI stage. |
| D - knowledge sharing | Must agree to publicly share knowledge about, and resulting from, the project |
| E - intellectual property | Must have ownership or access to any IP necessary to complete the project, and provide evidence to that effect at full application as necessary. |
| G - compliance with other requirements | Completeness and comprehensiveness of application against merit criteria  
Disclose any legal proceedings  
Accept all requirements in Part 6 of the Guidelines |
### Merit criterion A - Contributes to Advancing Renewables Program objectives

| Priorities                                | How the project will contribute to the ARP objectives  
|                                         | ST Forecasting Funding Announcement – see following slide |
| Potential Impact                         | What the potential impact of the Project is to support the development of a secure and reliable electricity system |
| Path to Market                           | Outline the pathway to market for the technology including a timeframe to commercialisation.  
|                                         | How does the Project facilitate or accelerate movement along that pathway? |
| Other                                    | Other contributions the Project will make in the achievement of ARP objective(s) not already mentioned |
Merit criterion A - Consider funding announcement objectives

- How your proposed forecasting approach is expected to improve on the accuracy of the current forecasts (AWEFS/ASEFS)
- Your approach to validating the self-forecast and measuring its degree of accuracy
- How your proposed approach is novel, whether it is a first-of-a-kind approach, or builds on existing work or techniques
- A credible path to commercialisation or wider market adoption of your proposed approach
Merit criterion B - Applicant capability and capacity (EOI)

**Capability**
- Project team’s (applicant and partners) track record of research excellence and skills as relevant to the proposed Project

**Capacity**
- Demonstrate the applicant organisation and any partner organisations and key personnel have the resources, skill, expertise and research infrastructure (or that these will be accessible or made available) to achieve the Project outcomes.

*Applications which include a Market Semi-scheduled Generator (wind or solar plant) will be considered of higher merit*
Merit criterion C - Project design and methodology

- Technical design or methodology that will be employed to achieve the Project outcomes.
- Timeline for the Project, including milestones, stage-gates, dependencies and deliverables associated with the Project.
- Main risks to achieving the outcomes of the Project and how these risks will be mitigated (e.g. risk in - technological, project planning, infrastructure and equipment access, personnel and WHS).
- Specifically address any cybersecurity risks, and risks of unscheduled generator outages for extended time periods.

A single one-sided A4 page containing an image or diagram to assist in the description of the technical design and research methodology may be attached.
### Merit criterion D - Financial viability and co-funding commitment

<table>
<thead>
<tr>
<th>Budget Table</th>
<th>Justification</th>
</tr>
</thead>
<tbody>
<tr>
<td>● Simple budget table in ARENANet</td>
<td>● Justification for the requested funding ($ and proportion)</td>
</tr>
<tr>
<td>● Budget may vary up to 25% between EOI and Full Application</td>
<td>● Eligible expenditure</td>
</tr>
</tbody>
</table>

*Check against eligible expenditure guidelines in Appendix B of the Guidelines*
Merit criterion E - Knowledge sharing

- What is the value of the knowledge expected to be generated by the Activity and its contribution to industry understanding of Short Term Forecasting?
- How well that knowledge is targeted to specific audiences?
- The types of data that will be made available to AEMO, ARENA and other industry stakeholders as part of the project?
- How knowledge or data obtained through the Activity will be shared publicly?
Funding expectations

- Projects are expected to **at least** match ARENA funding on 1:1 basis. Cash and in-kind contributions count towards matched funding.
- Demonstrate need for ARENA funding.
- Higher cash contribution = higher merit.
Timeline for application and assessment process

- **March 28:** EOI application open
- **May 9:** EOI application closes
- **June 14:** Successful EOI invited to submit full application
- **June - September:** Full applications submitted, negotiate and agree ARENA funding agreement
Key links

Short Term Forecasting webpage

Funding Announcement

ARENANet

Guidelines

FAQs
Agenda

1. Introduction and strategic context
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