

# **TRANSFORMATIVE RESEARCH ACCELERATING COMMERCIALISATION (TRAC) PROGRAM ROUND 1**

ULTRA LOW COST SOLAR PV  
FUNDING ANNOUNCEMENT

2022



Australian Government  
Australian Renewable  
Energy Agency

**ARENA**

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# ULTRA LOW COST SOLAR PV FUNDING ANNOUNCEMENT

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This Ultra Low Cost Solar PV Funding Announcement (Funding Announcement) details the competitive process the Australian Renewable Energy Agency (ARENA) will use to fund Projects under Round 1 of the TRAC Program (the Program). This process is referred to as the Funding Round and the Priority Technology (Round Priority) of this Funding Round is Ultra Low Cost Solar PV (ULCS).

This Funding Announcement should be read in conjunction with the Program Guidelines, which apply to the Funding Round. Definitions contained in the Program Guidelines also apply to this Funding Announcement.

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## 1. CONTEXT

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The Australian Government's Long-Term Emissions Reduction Plan and Low Emissions Technology Statement 2021 (LETS) identifies that reducing the costs of solar generation will be critical to unlock the economic, employment and abatement potential of other priority low emissions technologies. The LETS has identified a stretch goal of \$15 per MWh for the Levelised Cost of Energy (LCOE) for utility scale solar PV. ULCS would support the cost effective production of green hydrogen and low emissions steel and aluminium.

The Program seeks Proposals from a broad range of applicants, including research groups, to accelerate cost reductions and meet the Australian Government's solar stretch goal.

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## 2. FUNDING ROUND OBJECTIVES

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The objectives of the Funding Round (Round Objectives) are to:

- a. support ambitious and sustainable cost reduction and improved efficiencies for utility scale solar PV across one of two Streams as outlined in Section 3 below.
- b. facilitate collaboration between research groups and industry by building on core research to drive commercialisation activities as part of an integrated project approach.

In order to support the Australian Government's stretch goal of \$15 per MWh for the LCOE for utility scale solar PV, the following intermediate technology targets (Technology Targets) have been identified. Proposals should target significant progress against these:

- a. Higher module efficiency: ARENA seeks to accelerate the development of commercially competitive modules with efficiencies above 30 per cent.
  - b. Lower costs of deployment: ARENA seeks to accelerate cost reductions for utility scale solar PV deployment toward 30 cents per watt. Achieving this is expected to require novel approaches to constructing solar farms.
  - c. Longevity: In order to meet the LCOE stretch goal, utility scale solar farms should have a minimum asset life of 30 years, with longer asset operating lifetimes expected.
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## 3. FUNDING ALLOCATION

ARENA has allocated a funding envelope of \$40 million (Funding Envelope) for the Funding Round. The Funding Envelope is split amongst two Streams as outlined below. The funding allocation for each Stream is indicative only and may be changed at ARENA's discretion.

STREAM	FUNDING ALLOCATION	SCOPE DESCRIPTION
Cells and modules	\$20 million	Improvement in the efficiency of cells and modules is a key lever for reducing LCOE. Cells and modules also need to be cost competitive, offer longevity and consider sustainability issues when manufactured and deployed at scale.
Balance of System costs and Operations and Maintenance	\$20 million	Significant reduction of Balance of System (BoS) costs and Operations and Maintenance (O&M) costs are also required to achieve the LETS stretch goal for ULCS. Innovative plant design configurations and the use of advanced automation in assembly and construction are potential pathways to lower utility scale solar PV construction costs. In the O&M phase, automated maintenance technology and intelligent plant monitoring systems are potential cost reduction pathways.

ARENA reserves the right to allocate an amount of funding that is lower than the Funding Envelope or to reallocate funding between the two Streams if there is an insufficient number of high merit Proposals received under one or both Streams. ARENA may, at its discretion, allocate an amount of funding greater than the Funding Envelope if it considers this to represent value for money.

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## 4. SCOPE OF ACTIVITY

The Funding Round is open to Projects that align with the Round Objectives. Proposals must comply with the following parameters:

- The amount of ARENA grant funding requested must be a minimum of \$2 million and no greater than \$8 million;
- Projects align with the scope of one of the Streams outlined in Section 3 and target significant cost reductions;
- Project timeframe of up to five years, which is split between core research (up to three years) and commercialisation activities (up to two years). A stage-gate mechanism will be implemented within the Funding Agreement to assess the viability of the proposed technology and commercialisation pathway prior to commencing stage 2 (Commercialisation);
- Development of technology that is assessed as having achieved a minimum Technology Readiness Level of 3 at the time of applying. Projects should aim to progress the relevant technology beyond its starting TRL;
- The Applicant must present a proposed commercialisation pathway for the technology, which is expected to be refined during the course of the Project; and
- Proposals must budget no more than 50 per cent of total ARENA funding sought towards commercialisation activities, to a limit of \$2.5 million.

# 5. ELIGIBILITY REQUIREMENTS

Applicants under this Funding Round are required to meet all Eligibility Criteria as outlined in Part 3 of the Program Guidelines and the following.

PROGRAM ELIGIBILITY CRITERIA	APPLICATION TO FUNDING ROUND
<i>B - Eligible Project</i>	<p>The Applicant must be able to demonstrate to the satisfaction of ARENA that the Project described in the Proposal:</p> <ul style="list-style-type: none"><li>› involves Ultra Low Cost Solar PV;</li><li>› addresses one of the Stream requirements in section 3;</li><li>› is aligned with both of the Round Objectives; and</li><li>› meets the definition of R&amp;D activities as set out at item 3.5 of the Program Guidelines.</li></ul> <p>Further, the Proposal must:</p> <ul style="list-style-type: none"><li>› involve a technology with a minimum of TRL 3 at the time of applying;</li><li>› involve a project timeframe of no more than 5 years including up to 3 years for the R&amp;D stage and up to 2 years for the commercialisation stage;</li><li>› request a total ARENA grant of between \$2-8 million; and</li><li>› request no more than 50% of the ARENA funding towards commercialisation activities, to a maximum of \$2.5 million.</li></ul>

# 6. CLARIFICATION OF MERIT CRITERIA

The merit criteria for the Funding Round includes all criteria in clause 4 of the Program Guidelines, with additional detail and clarifications as set out in the table below. Applications must address each of the merit criteria. A list of requirements for each stage of the application process is provided at Appendix A and should be addressed in addition to the items set out in this section.

PROGRAM MERIT CRITERIA	APPLICATION TO FUNDING ROUND
<i>A - Contributes to the Program Outcomes and Round Objectives</i>	<p><i>This criterion assesses how well the Project contributes to the Program Outcomes, the Round Objectives and Round Priorities as detailed in the Program Guidelines and this Funding Announcement.</i></p> <p>In assessing the contribution of a Project to the Program Outcomes, ARENA will consider:</p> <ul style="list-style-type: none"><li>› The alignment to the Funding Round Objectives, Technology Targets and Scope of the Activity.</li><li>› The cost reduction and/ or efficiency delivered by the Project with reference to the incumbent technology or process that the Project is improving upon. For Proposals submitted under the Cells and Module Stream, references to cost-effectiveness must take into consideration the cost of generation over the lifetime of a solar panel. The International Technology Roadmap for Photovoltaic (ITRPV), April 2021,<sup>1</sup> must be used as a benchmark for performance of current mass-market solar PV technologies.</li><li>› How the Project contributes to the achievement of sustainable outcomes through two aspects:<ul style="list-style-type: none"><li>◦ Sustainable manufacturing process and inputs including but not limited to wet and dry inputs, chemicals, factory emissions etc.</li><li>◦ Circular economy in the context of production and use of PV as an electricity generation source including but not limited to end of life management, component and/or materials recovery etc.</li></ul></li><li>› The potential for the Project and its application to be replicated and provide a clear path for further cost reduction of solar PV generation. This may include analysis of the solar PV generation cost drivers to demonstrate cost reductions beyond this Project.</li></ul>

<sup>1</sup> <https://itrpv.vdma.org/download>

PROGRAM MERIT CRITERIA	APPLICATION TO FUNDING ROUND
<i>B - Applicant capability and capacity</i>	<p>This criterion assesses the capability and capacity of the Applicant and Project Partners to deliver the Project.</p> <p>In assessing this criterion, ARENA will consider:</p> <ul style="list-style-type: none"> <li>› the demonstrated level of experience and expertise of the Applicant and/or Applicant's consortium with a focus on industrial partnerships with developers, generators, manufacturers and other solar end users with an Australian presence; and</li> <li>› the quality and completeness of Project documentation and agreements provided to ARENA, as well as the extent to which these provide evidence of the Applicant's capability and readiness to develop the Project.</li> </ul>
<i>C - Project design and methodology</i>	<p>This criterion assesses:</p> <ul style="list-style-type: none"> <li>› technical strength of the Project and how well the Applicant has designed and planned the Project, including identifying and managing risks, in order to successfully deliver the Project; and</li> <li>› Project risk not identified in the assessment of the other Merit Criteria and the steps the Applicant proposes to take to mitigate those risks. It also assesses Project risk in terms of the likely success of the Project and the achievement of stated outcomes and considers the risk of negotiating and executing a Funding Agreement that is acceptable to ARENA.</li> </ul> <p>In assessing this criterion, ARENA will consider:</p> <ul style="list-style-type: none"> <li>› the quality and completeness of the Project Plan, including the level of Project definition;</li> <li>› the level of Project technical definition and pathway to complete the core research activities;</li> <li>› the completeness of the Project timeline;</li> <li>› the quality of the Applicant's proposed commercialisation pathways for the technology. The commercialisation plan is expected to be developed and refined during the R&amp;D phase of the Project building on the Project's core research activities;</li> <li>› the quality of the Risk Management Plan (including the extent to which the requirements outlined in Appendix A have been addressed) and the extent to which key risks have been identified and mitigated;</li> <li>› the extent to which the Applicant accepts the terms of the Funding Agreement template; and</li> <li>› the Applicant's compliance with any other requirements outlined in Part 2 of the Program Guidelines.</li> </ul>
<i>D - Financial viability and co-funding commitment</i>	<p>ARENA will assess the amount of ARENA funding sought and total cost of the Project within the competitive framework elements outlined under Merit Criterion A. The ARENA Grant request is not expected to change materially between the EOI stage and the Full Application stage, refer to Section 7 part (c) for further information.</p>

Proposals must address the relevant Additional Information Requirements set out in Appendix A.

## 7. APPLICATION AND ASSESSMENT PROCESS

An application made under the Funding Round must be completed according to the Program Guidelines.

Further details are outlined below on the application and assessment process that is specific to the Funding Round.

### a. Measurement and assessment by ARENA

When evaluating Proposals against the Round Objectives, ARENA will assess Proposals against the Scope of Activity parameters and the Program Merit Criteria provided in Sections 4 and 6 above and the Guidelines.

Note that Section 6.8 of the Program Guidelines allows ARENA (in its absolute discretion) to reject, refuse to consider, or cease evaluating an EOI or Full Application at any time if ARENA determines (at its absolute discretion) that the EOI or Full Application is unlikely to be successful. This will apply particularly when a Proposal does not fit within the Scope of Activity parameters (as presented in Section 4) for this Funding Round.

**b. EOI stage**

EOI Proposals must clearly address each of the Program Merit Criteria, taking into account the clarifications provided in the table above. EOI Proposals will be assessed against the Program Merit Criteria, and rank ordered. Each Merit Criterion has equal weight.

Only Proposals assessed as being of high merit against the Program Merit Criteria may be invited to submit a Full Application. Not all Proposals assessed as high merit may be invited to submit a Full Application; only the highest ranking Proposals will be invited to submit a Full Application.

EOI Proposals must be completed online using ARENA's Grants Management System, ARENANet, which is accessible from the [TRAC Program](#) webpage on ARENA's website [arena.gov.au](http://arena.gov.au) no later than 5 PM (AEST) on the EOI Due Date.

Further details on information requirements for the EOI stage are presented at Appendix A.

**c. Full Application stage**

A Full Application will only be accepted from Applicants invited by ARENA to submit a Full Application following the assessment of EOIs. ARENA may issue an Updated Funding Announcement at the commencement of the Full Application stage. Full Applications must clearly address each of the Program Merit Criteria, taking into account the clarifications provided in the table above. Full Applications will be assessed against the Program Merit Criteria and rank ordered. Each merit criterion has equal weight.

Only Proposals that are assessed as being of high merit against the Program Merit Criteria at Full Application stage will be considered for funding.

The highest ranked Proposals will be recommended to the ARENA Board for funding approval subject to the Funding Envelope available and the portfolio approach described below.

Full Applications must be completed online using ARENA's Grants Management System, ARENANet, which is accessible from the [TRAC Program](#) webpage on ARENA's website [arena.gov.au](http://arena.gov.au) no later than 5pm (AEST) on the Full Application Due Date.

Further information on requirements for the Full Application stage is presented at Appendix A.

To ensure fairness in the assessment, no material change to the Proposal will be permitted between the EOI and Full Application stages. ARENA retains the right to not assess Full Application Proposals where a material change(s) is observed from the EOI stage. ARENA will determine, at its discretion, whether any such change is material in nature.

A material change would include but is not limited to:

- i. a change in the focus of fundamental research activities; and/or
- ii. an increase in the size of the ARENA Grant request greater than 10 per cent of the ARENA Grant request at the EOI stage.

Similarly, no material change to the Project is expected between the Full Application and execution of the Funding Agreement. ARENA will determine, at its discretion, whether any such change is material in nature. In the event that a material change occurs, ARENA reserves the right to determine if the changes are acceptable and support the objectives of the Funding Round. ARENA may, at its discretion, determine it is appropriate to increase the amount of ARENA funding if it is considered to represent value for money and in line with the Round Objectives and subject to the Applicant meeting the conditions of the Offer to Negotiate letter.

**d. Publication of information**

ARENA will publish aggregated and non-identifiable data<sup>2</sup> from the Proposals received at the conclusion of the EOI and Full Application stages of the Funding Round to provide a high level of transparency to stakeholders on the range of Proposals received.

**e. Portfolio approach**

ARENA intends to apply a portfolio approach when offering funding under the Funding Round under clause 2.22 of the Program Guidelines. ARENA may elect not to fund an otherwise meritorious Project, or a higher ranked Project, if the aims or outcomes of that Project are the same as, or similar to, the aims and outcomes of a Project that ARENA is intending to fund through the Funding Round or has previously funded.

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<sup>2</sup> Where relevant, ARENA expects to present data and information on the basis that it has been received.

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## 8. OFFER TO NEGOTIATE

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Applicants that are successful at the Full Application stage of the Funding Round will be issued a non-binding Offer to Negotiate letter. The Offer to Negotiate will outline the terms under which ARENA is prepared to enter into negotiations for a Funding Agreement for the Proposal. The Offer to Negotiate will outline:

- a. the amount of ARENA funding that is being offered;
- b. any conditions attached to the negotiation offer;
- c. the terms under which ARENA may withdraw the offer of funding; and
- d. other relevant information.

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## 9. FUNDING AGREEMENT

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The Funding Agreement will provide the legal framework for the obligations of each party and terms of payment for each successful Full Application under the Funding Round.

ARENA's Funding Agreement template is provided on the ARENA website page dedicated to the Funding Round at [arena.gov.au/funding/ulcs](https://arena.gov.au/funding/ulcs). Applicants are expected to accept this Funding Agreement with no changes.

Applicants are required to provide a response to the template Funding Agreement with their Full Application. A table identifying areas of non compliance with the standard terms and conditions in the Funding Agreement template and summarising proposed amendments is to be provided at the Full Application stage.

The Funding Agreement will stipulate the milestones for the Project that the Recipient will be expected to adhere to.

Applicants should be aware that low compliance with the Funding Agreement template will impact on ARENA's assessment of Project risk. Strong compliance with the Funding Agreement will generally increase the merit of a Proposal.

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## 10. KNOWLEDGE SHARING PLAN

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As required under Eligibility Criterion G, the Applicant must agree that it will participate in any knowledge sharing events and activities related to the Funding Round. ARENA's Knowledge Sharing Plan template is provided on the ARENA website page dedicated to this Funding Round at [arena.gov.au/funding/ulcs](https://arena.gov.au/funding/ulcs). Applicants are expected to accept this Knowledge Sharing Plan with no, or very limited, changes.



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# 11. TIMETABLE

The timetable for the Funding Round is presented in the table below.

EOI STAGE	
EOI Open Date	Monday 7 February 2022
EOI Due Date	5 PM Australian Eastern Standard Time (AEST), Monday 11 April 2022
FULL APPLICATION STAGE	
Applicants invited to submit a Full Application	ARENA aims to issue invitations to submit a Full Application in May 2022.
Full Application Due Date	Full applications will be due eight weeks after the invitations to submit a Full Application are sent.
Offer to Negotiate or communication of outcome of the Full Application stage	ARENA aims to issue outcome letters from the Full Application stage prior to 30 August 2022.

ARENA will not accept an EOI or a Full Application submitted after the relevant due dates.

The above dates represent the current timetable for the Funding Round. ARENA retains the right to amend proposed timelines and stages or alter any element of the Funding Round at its discretion. ARENA may extend or change the timetable for the Funding Round, if ARENA deems this beneficial to achieving the Objectives of the Funding Round.

# GLOSSARY

\$	All references to dollars or \$ are to Australian Dollars.
AEST	Australian Eastern Standard Time.
Applicant	An eligible institution as defined in item 3.3 of the Program Guidelines that has submitted a Proposal for funding under the Program.
Eligibility Criteria	The criteria set out in Part 3 of the Program Guidelines.
EOI Open Date	Monday 7 February 2022.
EOI Due Date	5 PM Australian Eastern Standard Time (AEST), Monday 11 April 2022.
Full Application Due Date	Full applications will be due eight weeks after the invitations to submit a Full Application are sent.
Funding Agreement	The agreement between a Recipient and ARENA for funding under the Program. A template is available on the ARENA website.
Funding Envelope	\$40 million allocated to this Funding Round.
Funding Round	The competitive process that will be used by ARENA under the Program to fund ULCS Projects as set out in this Funding Announcement.
Knowledge Sharing Plan	Template plan setting out the minimum knowledge sharing deliverables expected to be provided by the Applicant available on the ARENA website.
LETS	The Federal Government's Low Emissions Technology Statement (2021).
Merit Criteria	The assessment criteria set out in Part 4 of the Program Guidelines and clarified in this Funding Announcement.
Offer to Negotiate	ARENA will issue a non-binding offer to negotiate a Funding Agreement to those Applicants that are successful at the Full Application stage of the Funding Round.
Priority Technology	Ultra Low Cost Solar PV is the Priority Technology for this Round Funding Announcement.
Program	the Transformative Research Accelerating Commercialisation (TRAC) Program.
Program Guidelines	the Transformative Research Accelerating Commercialisation (TRAC) Program Guidelines.
Project	Research, development and commercialisation activities involving a Renewable Energy Technology that meets the Program's objectives and priorities as advised in the Guidelines and this Funding Announcement.
Project Partner	A person, organisation or institution that the Applicant has engaged as a joint venturer, contractor or consultant to help deliver the proposed Project activities.
Project Plan	A project plan document that contains the information requirements listed in Appendix A of this Funding Announcement.
Proposal	An application to ARENA for a proposed TRAC Program Project.
Risk Management Plan	A risk management plan that contains the information requirements listed in Appendix A of this Funding Announcement.
Round Objectives	The objectives of the Funding Round set out in Section 2 of this Funding Announcement.
Solar PV	Solar photovoltaic.
Stream	Stream of ULCS as defined in Section 3.
Technology Targets	The intermediate technology targets for utility scale solar PV as outlined in Section 2.
Total Project Cost	All costs incurred to undertake the Project activities.
ULCS	Ultra Low Cost Solar PV, which is one of the Federal Government's priority technologies under the Low Emissions Technology Statement ("LETS") 2021.

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# APPENDIX A – ADDITIONAL INFORMATION REQUIREMENTS

Note Proposals should include information in this Appendix in addition to the guidance provided in Section 6 Clarification of Merit Criteria.

## EOI STAGE

At EOI stage, Applicants must provide the following attachments with their Proposal:

- a. An attachment of up to four pages that describes technical aspects of the Project and any other important aspects of the Project that are not able to be addressed via the Application Form.
- b. An indicative timetable outlining the key activities and deliverables for the Project. The timetable should include:
  - › indicative milestones and deliverables consistent with the Milestones table budget and timeframes contained in Schedule 1 of the Funding Agreement template;
  - › a summary of the expected level of commitment from industry partners as the Project progresses against the Milestones; and
  - › proposed high level metrics that would be used to assess Project performance to inform a decision on whether the Project should move to the commercialisation stage.

## FULL APPLICATION STAGE

At Full Application stage, Applicants must provide the following:

- a. In addition to the requirements specified in Section 6 Clarification of Merit Criteria, Applications should also provide a Project Plan (no more than 40 pages) document that includes (at a minimum):
  - i. Summary of the Project including a clear description of the objectives and technical activities and proposed location.
  - ii. Explanation of how the Project builds on previous work and knowledge.
  - iii. A detailed commercialisation plan for the solution/ technology (to be refined during the course of the Project).
  - iv. List of the key Project Partners, summary of their experience, including their proposed role in the Project.
  - v. A detailed timetable for the Project consistent with the Milestones table budget and timeframes as outlined under Schedule 1 of the Funding Agreement template. The timetable should include:
  - vi. objectively verifiable milestones and deliverables consistent with the Milestones table budget and timeframes contained in Schedule 1 of the Funding Agreement template;

- vii. a summary of the expected level of commitment from industry partners as the Project progresses against the Milestones; and
- viii. proposed metrics that would be used to assess Project performance to inform a decision on whether the Project should move to the commercialisation stage.
- ix. Key Project and performance metrics including targeted efficiencies, scale, LCOE (\$/MWh) (where applicable) and how the Project will contribute to these.
- x. Any other relevant information.
- xi. An appendix noting responses to any EOI feedback.

## Attachments

- a. Risk Management Plan (using ARENA's template), which should include:
  - › consideration of personnel risk and how this will be managed;
  - › consideration of technology risk and how this will be managed;
  - › details on how the Applicant will manage contingency costs and cost overruns.
  - › any other key Project risks; and
  - › Work Health and Safety Management System Plan.
- b. A statement of acceptance of the requirements set out in the Knowledge Sharing Plan.
- c. Table identifying areas of non compliance with the standard terms and conditions in the Funding Agreement template and summarising proposed amendments.
- d. Evidence/letters of support by the Applicant and any Project Partners, including their commitment to provide the specified cash and In-Kind Contributions.
- e. Information to confirm the Applicant (and any Project Partners) has (have) the financial capacity to fund its proposed share of the funding or In-Kind Contributions for the duration of the Project.
- f. A list of any Research and Development Projects in a similar field for which the Applicant or the key personnel have received funding from Australian Government, state government and local government sources (including from agencies such as ARENA) in the past three years.
- g. CVs of key personnel (limit of 2 pages per person).
- h. For Proposals submitted under the Cells and Modules Stream, a one page attachment to support claims against alignment with the ITRPV. This may include graphical representations where relevant.

Further information is available at  
[arena.gov.au](http://arena.gov.au)

## Australian Renewable Energy Agency

To explore potential for funding visit:  
[arena.gov.au/funding](http://arena.gov.au/funding)

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