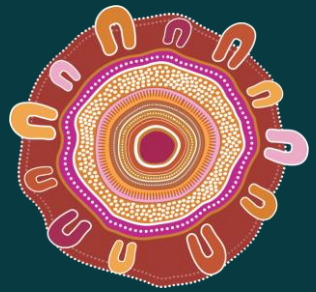
Australian Government
Department of Climate Change, Energy, the Environment and Water

Australian Government
Australian Renewable Energy Agency

ARENA 10 YEARS

Hydrogen Headstart Public Consultation

Department of Climate Change, Energy, the Environment & Water
Australian Renewable Energy Agency
July 2023



We acknowledge the Traditional Owners of country throughout Australia and recognise their continuing connection to land, waters and culture. We pay our respects to their Elders past and present.

Disclaimer:

The following presentation was used as part of the Information and Consultation Forums for the Hydrogen Headstart Competitive Round (Competitive Round).

The Department of Climate Change, Energy, Environment and Water (DCCEEW) and the Australian Renewable Energy Agency (ARENA) are working in collaboration to design the Competitive Round.

The Consultation Paper and this presentation contain the indicative specifications for the Competitive Round, on which DCCEEW and ARENA are seeking stakeholder feedback.

These proposed specifications are indicative only and designed to stimulate input. They should not be taken to presuppose any final design features. The final program design will be developed from input from the consultation process and may differ to the parameters outlined in the Consultation Paper and this presentation.

Should you have any queries or require any clarification in relation to the following presentation, please email hydrogenheadstart@dcceew.gov.au

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I. Overview of Australian Government hydrogen initiatives

II. Hydrogen Headstart consultation:

1. ARENA's Role in Hydrogen
2. Overview of Consultation Process
3. Competitive Round Objectives
4. Proposed Competitive Round Design
5. Proposed Merit Criteria & Timetable
6. Next Steps
7. Q&A

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Australian government hydrogen initiatives

Programs underway to help develop Australia's hydrogen industry include:

- $2 billion Hydrogen Headstart Program
- Review of the National Hydrogen Strategy
- Guarantee of Origin scheme
- Regional Hydrogen Hubs program
- Reviewing Australia's regulatory frameworks
- Annual State of Hydrogen Report
- National Hydrogen Infrastructure Assessment
- Improving workforce skills and training

National Hydrogen Strategy Review

- Australia is well placed to develop a hydrogen industry – $300 billion pipeline
- Our Hydrogen Strategy provided the initial steps but was meant to be adapted
- Global environment has transformed since 2019 release – appetite for decarbonisation, clean products, and willingness to secure domestic industry e.g. US IR Act
- Reviewing the strategy reflects an adaptive approach, desire to integrate better with economy-wide decarbonisation, greater global competition for trade in H2 and associated manufactured goods

Guarantee of Origin Scheme (GO Scheme)

Internationally-aligned scheme to measure, track and verify the carbon emissions and other attributes of Australian clean energy products (including hydrogen and hydrogen energy carriers).

It will enable consumers across domestic and international markets to identify and purchase the products that meet their individual needs.

GO certificates will provide a mechanism to verify production, emissions intensity and renewable electricity use for the Headstart Program.

First Nations engagement

- Valuing First Nations land and water rights, cultural heritage and genuine engagement with First Nations communities is essential to Australia's social and economic success
- An additional $2 million has been announced to help First Nations people engage meaningfully with hydrogen project developers
- Our discussions to date with First Nations groups indicates a wide span of understanding and engagement with hydrogen.
- It is common for project proponents to arrive on Country with expectations of rapid approval on land access matters – Traditional Owners are often not well equipped to make well-informed, fact-based decisions

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AUSTRALIAN RENEWABLE ENERGY AGENCY

KEY STATISTICS 2012-2023

ARENA

Australian Government
Australian Renewable Energy Agency

INVESTED BY ARENA
$2.25B

PROJECTS
663

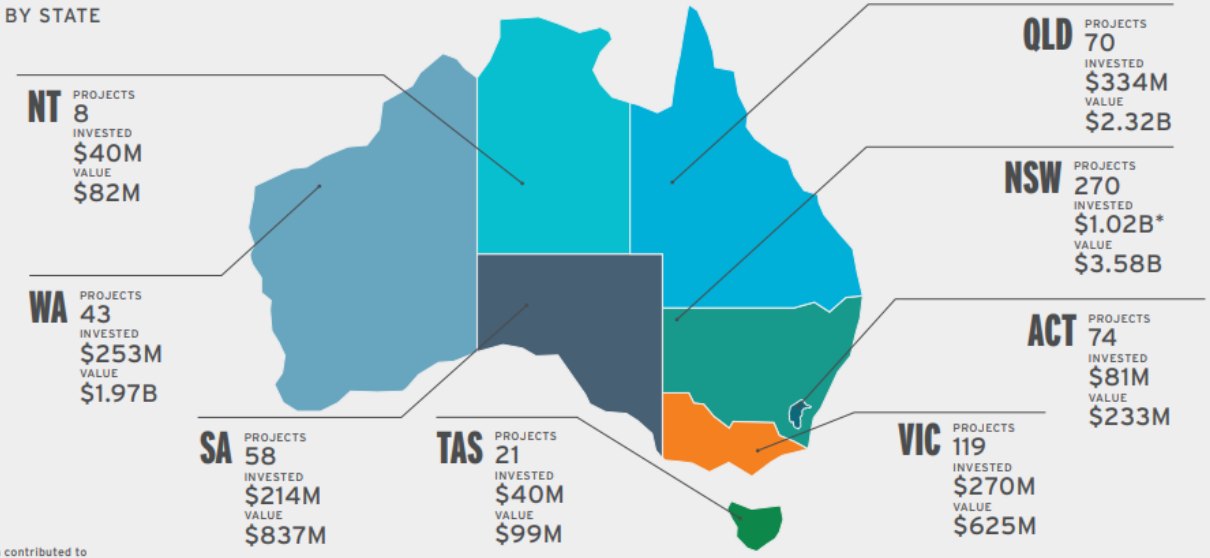
TOTAL PROJECT VALUE
$9.75B

INVESTMENT LEVERAGE
$1:$3.32

INVESTMENT BY TECHNOLOGY

BIOENERGY	GEOTHERMAL	GRID INTEGRATION	HYBRID	HYDROGEN	OCEAN	SOLAR PV	SOLAR THERMAL	STORAGE - BATTERIES/PHES
$131M	$42M	$386M	$112M	$247M	$44M	$818M	$242M	$231M

INVESTMENT BY STATE



NT
PROJECTS 8
INVESTED $40M
VALUE $82M

WA
PROJECTS 43
INVESTED $253M
VALUE $1.97B

SA
PROJECTS 58
INVESTED $214M
VALUE $837M

TAS
PROJECTS 21
INVESTED $40M
VALUE $99M

VIC
PROJECTS 119
INVESTED $270M
VALUE $625M

ACT
PROJECTS 74
INVESTED $81M
VALUE $233M

NSW
PROJECTS 270
INVESTED $1.02B*
VALUE $3.58B

QLD
PROJECTS 70
INVESTED $334M
VALUE $2.32B

* Includes $567 million contributed to projects inherited by ARENA in 2012.

INVESTMENT LEVERAGE ALONG THE INNOVATION CHAIN

STUDY	R&D	DEMONSTRATION	DEPLOYMENT
$1:$2.07	$1:$1.76	$1:$1.87	$1:$5.67

30 JUNE 2023

Investment Priorities

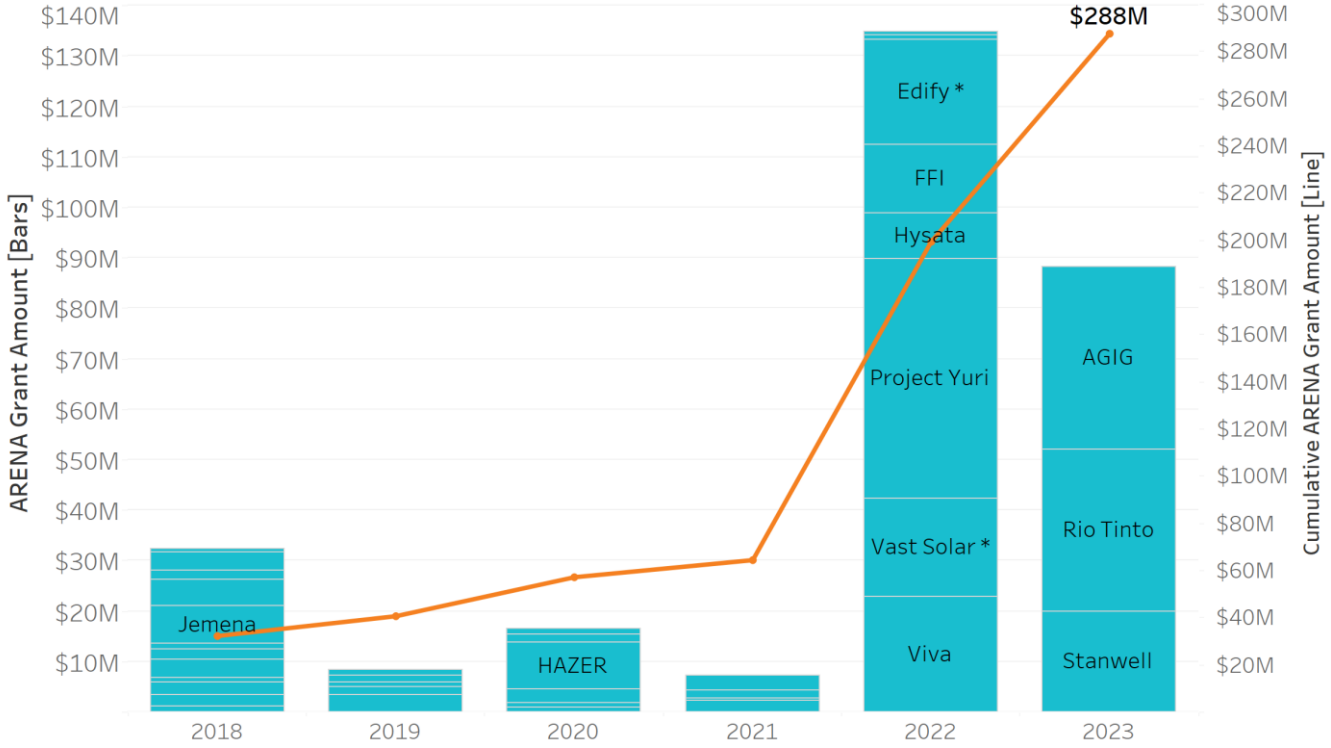
OPTIMISE THE TRANSITION TO RENEWABLE ELECTRICITY

COMMERCIALISE CLEAN HYDROGEN

SUPPORT THE TRANSITION TO LOW EMISSIONS METALS

DECARBONISE LAND TRANSPORT

ARENA has committed $288 million to 45 projects to seed Australia's hydrogen industry



Yara Pilbara Renewable Ammonia Project

Feasibility study leading to funding approval for deployment of a renewable hydrogen and renewable ammonia production and export facility (using a 10 MW electrolyser)

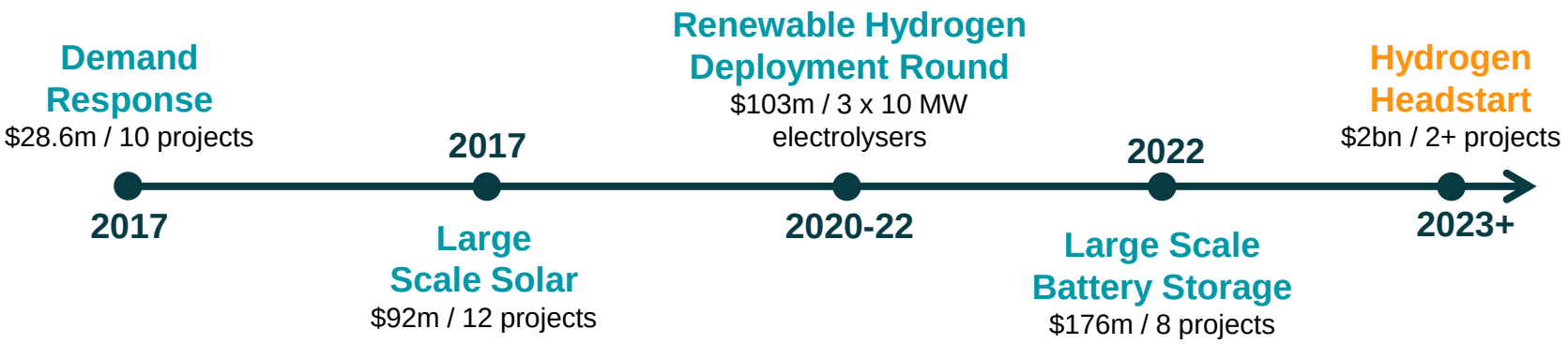
Feasibility - 2020 - $995k ARENA funding | Deployment - 2021 - $47.5m approved ARENA funding

Rio Tinto and Sumitomo Hydrogen Calcination Pilot

Feasibility study leading to funding approval for a trial of hydrogen calcination technology at the Yarwun alumina refinery in Gladstone (using a 2.5 MW electrolyser)

Feasibility - 2021 - $580k ARENA funding | Pilot - 2023 - $32.1m approved ARENA funding

Recent key competitive rounds



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Note: Competitive Round parameters are subject to change. Information contained in these slides is indicative only.

Background to Hydrogen Headstart

On 9 May 2023, the Australian Government announced it will invest **$2.0 billion** in the new **Hydrogen Headstart** program.

The Program reflects a responsive approach to global market signals and intends to **bridge the commercial gap** for early projects, putting Australia on course for **up to a gigawatt of electrolyser capacity by 2030** through **at least two large-scale projects**.

The Program will use a **competitive process** (Competitive Round), expected to focus on cost and deliverability, to select **large Australian-based projects** producing either hydrogen or hydrogen derivative products, produced from **renewable energy**.

Successful projects will be able to receive a **production credit over a 10-year period** to cover the commercial gap between the cost of hydrogen produced from renewables and the expected sales price.

Consultation Process Overview

We are seeking feedback on the proposed specifications for the Hydrogen Headstart Program

Your input will help ensure the Program:

- Is fit for purpose to deliver on the Government's objectives
- Provides the greatest impact for the sector

Feedback provided through today's Public Forum and in written form will be used to develop the final Program guidelines

- Today's Public Forum will go over key points of the paper
- The consultation paper is **indicative only,** and final program design will be developed following consultation
- We encourage participants to submit a detailed written response by:
  - Completing the form on the DCCEEW website
  - Emailing: hydrogenheadstart@dcceew.gov.au
- The consultation period will **close Thursday 3 August 2023**

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Hydrogen Headstart: Competitive Round Objectives

Produce renewable hydrogen at scale in Australia, facilitating an **accelerated pathway to the technical and commercial viability** of renewable hydrogen production and use at scale in Australia.

Support **domestic decarbonisation**, **build industry capability** and provide for **new economic opportunities** in our manufacturing and export industries.

Provide **price discovery and transparency** in relation to current and projected economics for renewable hydrogen (and derivatives), by sharing actual and forecast economics of applications received.

Reduce barriers for future deployments through **attracting private sector capital** (debt, equity & offtake).

Develop and retain **investment, skilled labour, intellectual property and supply chains** for a **domestic hydrogen industry**

Facilitate **knowledge sharing** throughout industry to assist with maturing the Australian hydrogen industry.

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Proposed eligibility requirements (1/2)

Technology

- **New deployment of electrolysis/renewable hydrogen production** facilities
- May utilise existing energy generation or hydrogen end use infrastructure
- Must be **renewable hydrogen and 100% powered by one or more of:**
  - behind the meter renewables,
  - grid electricity where LGCs or other certificates eligible under the GO scheme are surrendered to match 100% of electricity use, or
  - electricity from a renewable generation PPA with associated retirement of LGCs
- Hydrogen produced using coal gasification or SMR coupled with CCS will not be eligible
- Need to **comply with the proposed GO Scheme** (under development)

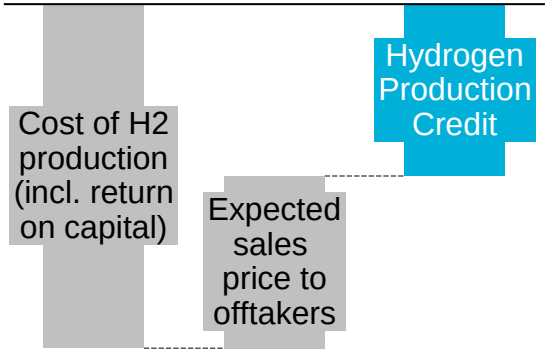
Proposed eligibility requirements (2/2)

Eligible end uses / offtake	• All end uses of hydrogen or hydrogen derivative products are eligible • There will be consideration of the balance between export and domestic use
Project size	• **50MW minimum; unrestricted maximum**
Location	• **Within Australia**; Does not need to be in a Government H2 hub region
Other	• Must be for a **single site** deployment. • Must have a **valid commercial case** for the end use of hydrogen. • Applications must include a **commercialisation (cost reduction) pathway analysis**

Illustrative only

Proposed funding mechanism

Hydrogen production credit
($/kg H2 or derivative)



Nominated by applicant in application

×

Volume of H2 produced
(kg H2 or derivative)

Actual volume of H2 or derivative produced in qtr *(Capped over 10-yr period; cap nominated by applicant)*

Paid quarterly in arrears based on actual production that quarter, over max. 10-year term

Note: Competitive Round parameters are subject to change. Information contained in these slides is indicative only.

Proposed mechanism for upside sharing or reduction in funding

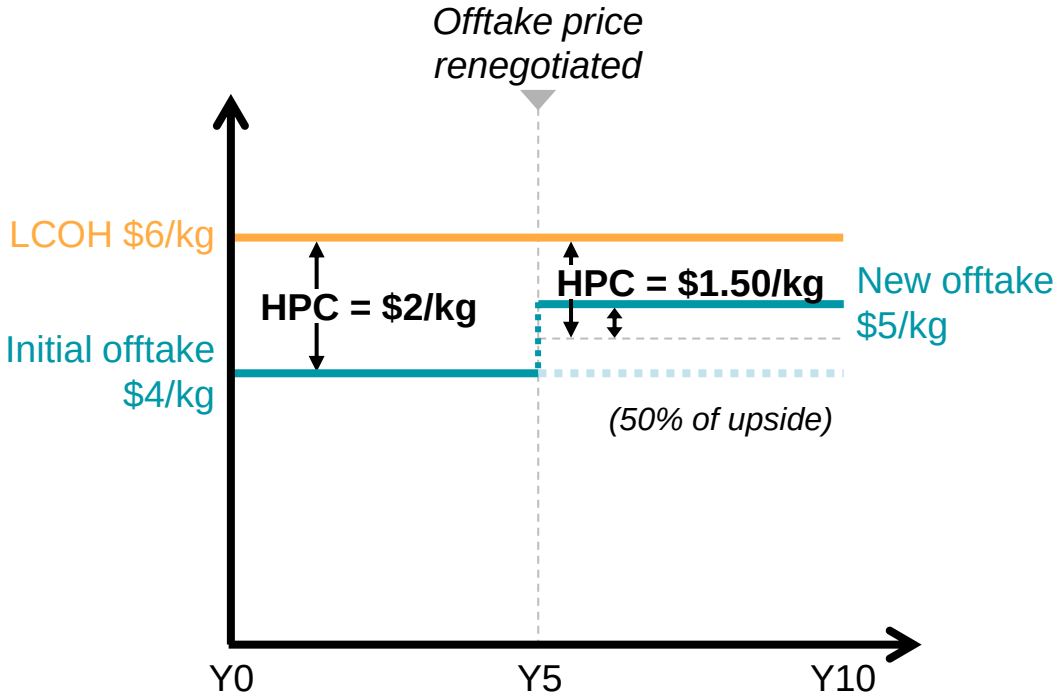
Upside sharing	50/50

- Upside arising from **decreased operating costs or increased sales price** over the contract term will be shared 50/50
- Recipients will be required to report on quantity, sales price and cost of production
- If the **sales price materially exceeds the level of support required** within the 10 years, recipients will be required to pay back an amount of the Govt support received in previous years

Downside sharing	Nil

- As funding is capped, agreed **Hydrogen Production Credit will not be increased** in the event of higher capital or operating costs than expected

Case study example – upside sharing (1/2)



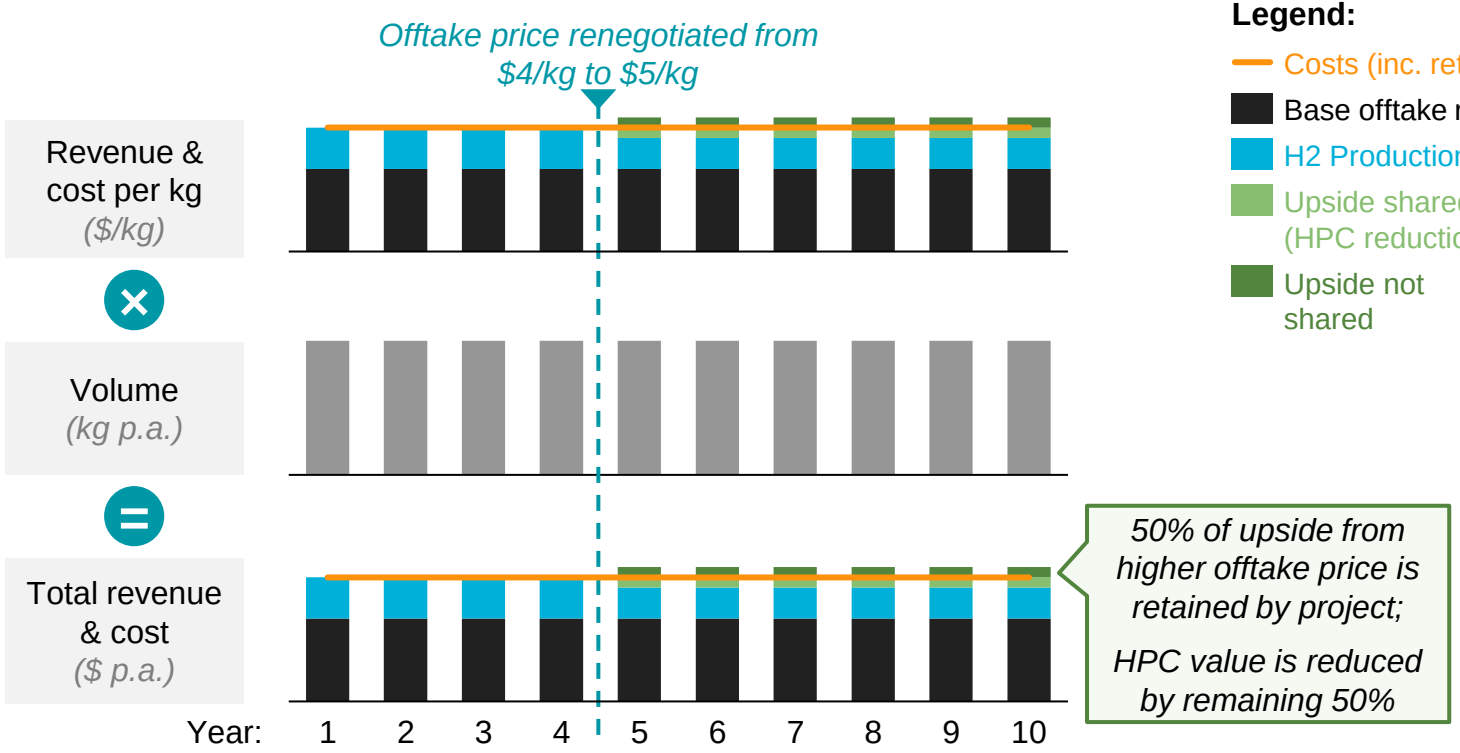
Case study details:

- LCOH $6/kg
- Initial offtake of $4/kg renegotiated to $5/kg at yr 5

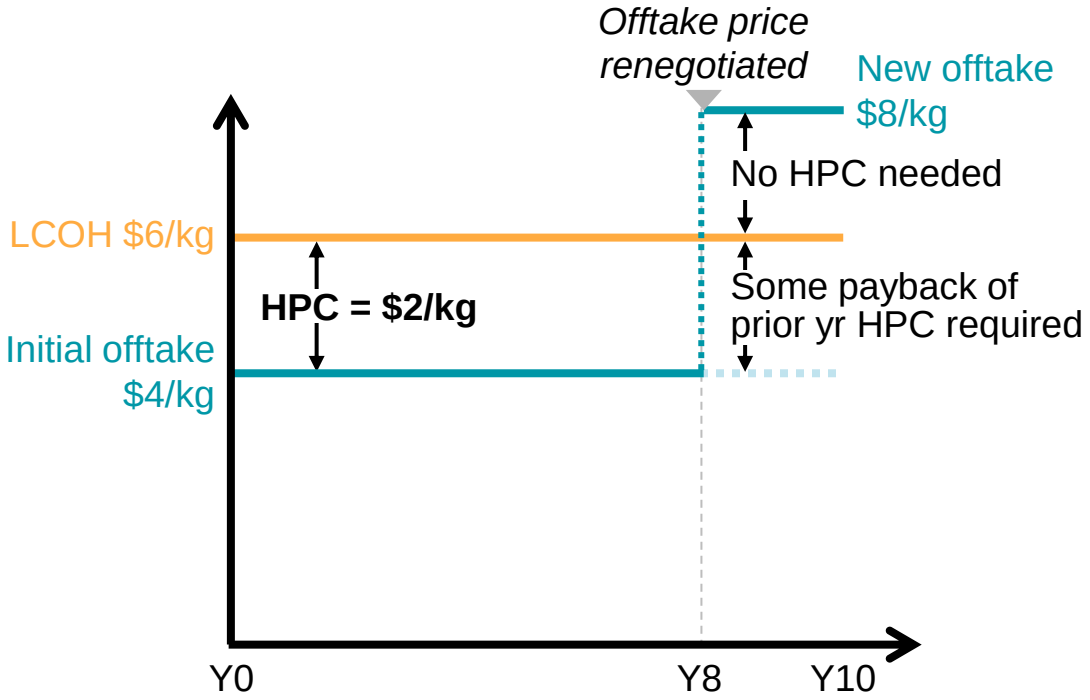
Impact of renegotiation:

- Offtake revenue increases
- Initial HPC of $2/kg reduced to $1.50/kg (sharing 50% of $1/kg upside)
- Annual subsidy decreases

Case study example – upside sharing (2/2)



Case study example – payback scenario (1/2)



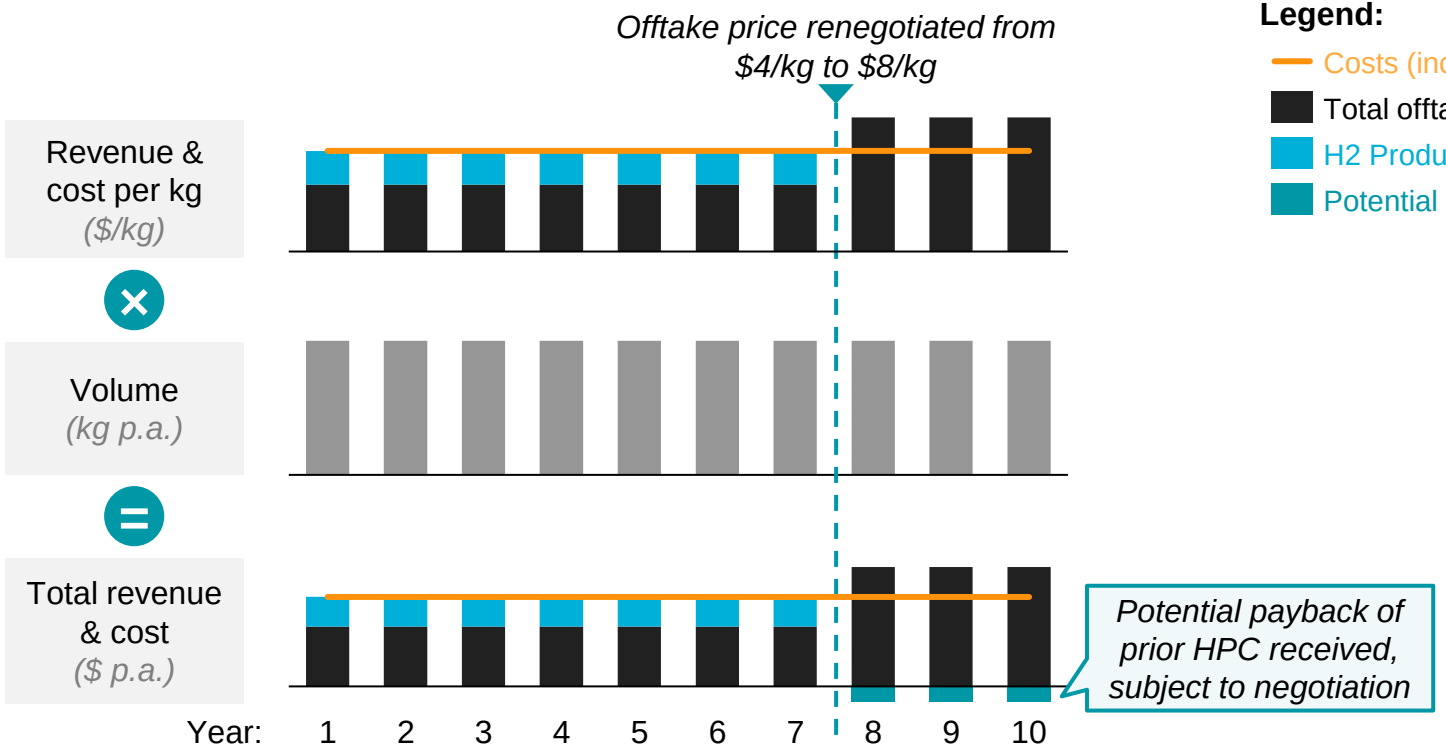
Case study details:

- LCOH $6/kg
- Initial offtake of $4/kg renegotiated to $8/kg at yr 8

Impact of renegotiation:

- Initial HPC of $2/kg reduced to nil at yr 8 as revenue > LCOH (no subsidy needed)
- Producer required to pay back an amount of the subsidy received in prior years (value determined at the time)

Case study example – payback scenario (2/2)

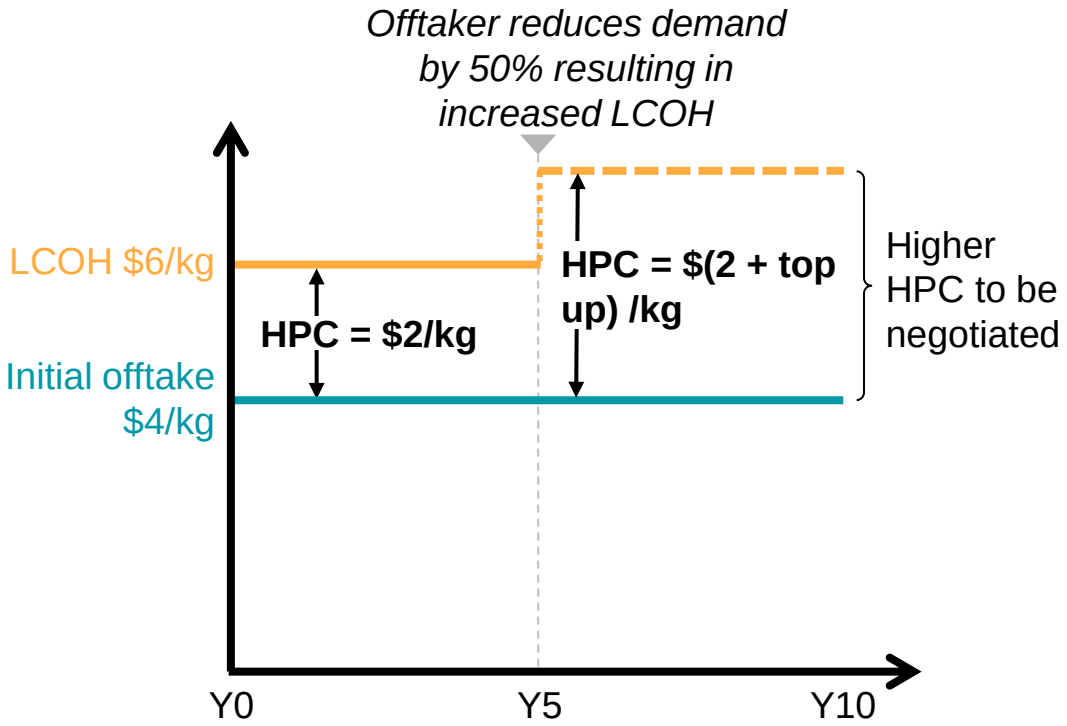


Volume risk support mechanism

Some international programs include volume risk as a contractual component
Key features of these include:

Example mechanism	Purpose
• **Top-up payment** on qualifying volume when **total volumes sold are less than a certain percentage of forecast volumes from offtake customers** • In other programs, volume risk support is paid to recipients through an **increased hydrogen production credit for each kilogram of hydrogen produced**	• **Mitigates the risk for recipients that offtake customers unexpectedly reduce demand and sales fall below the recipient's fixed costs.** This ensures proponents can still, at a minimum, service debt repayments but are structured such that returns cannot be improved • **Plant must be available to qualify**

Case study example – volume risk (1/2)



Case study details:

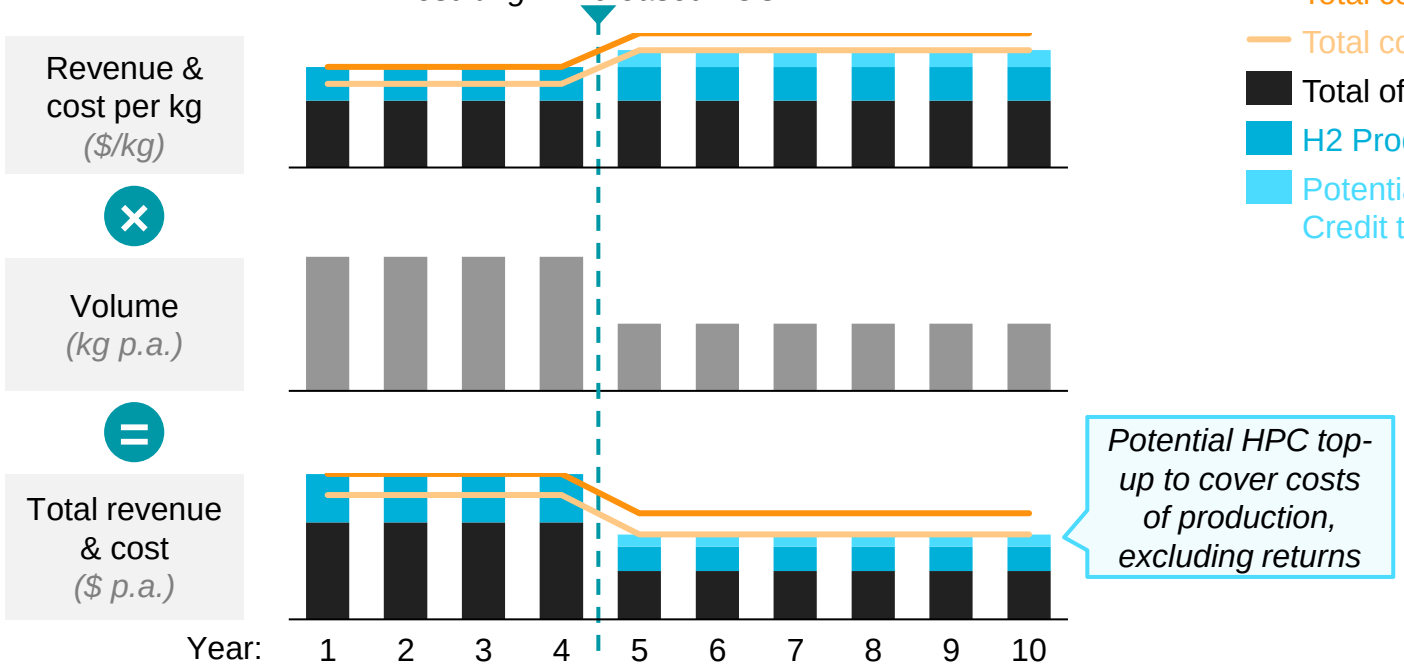
- LCOH $6/kg & Offtake $4/kg
- Offtaker volumes decrease by 50%

Impact of renegotiation:

- Initial HPC of $2/kg increased from yr 5 (including top up payment as agreed)
- Adjusted subsidy amount

Case study example – volume risk (2/2)

Offtaker reduces demand in year 5 by 50% resulting in increased LCOH



Legend:

- Total costs (incl. return)
- Total costs (excl. return)
- Total offtake revenue
- H2 Production Credit
- Potential H2 Production Credit top-up payment

Proposed payment frequency & term

Payment frequency	• **Quarterly in arrears**
Payment timing	• Available **from FY27** • Over **maximum 10-year term** • **Commencing on agreed start date**, linked to commercial operations & sunset dates in key offtake agreements
Payment termination	• Funding may be **terminated** if the project **ceases development or is materially delayed**, as agreed by the parties

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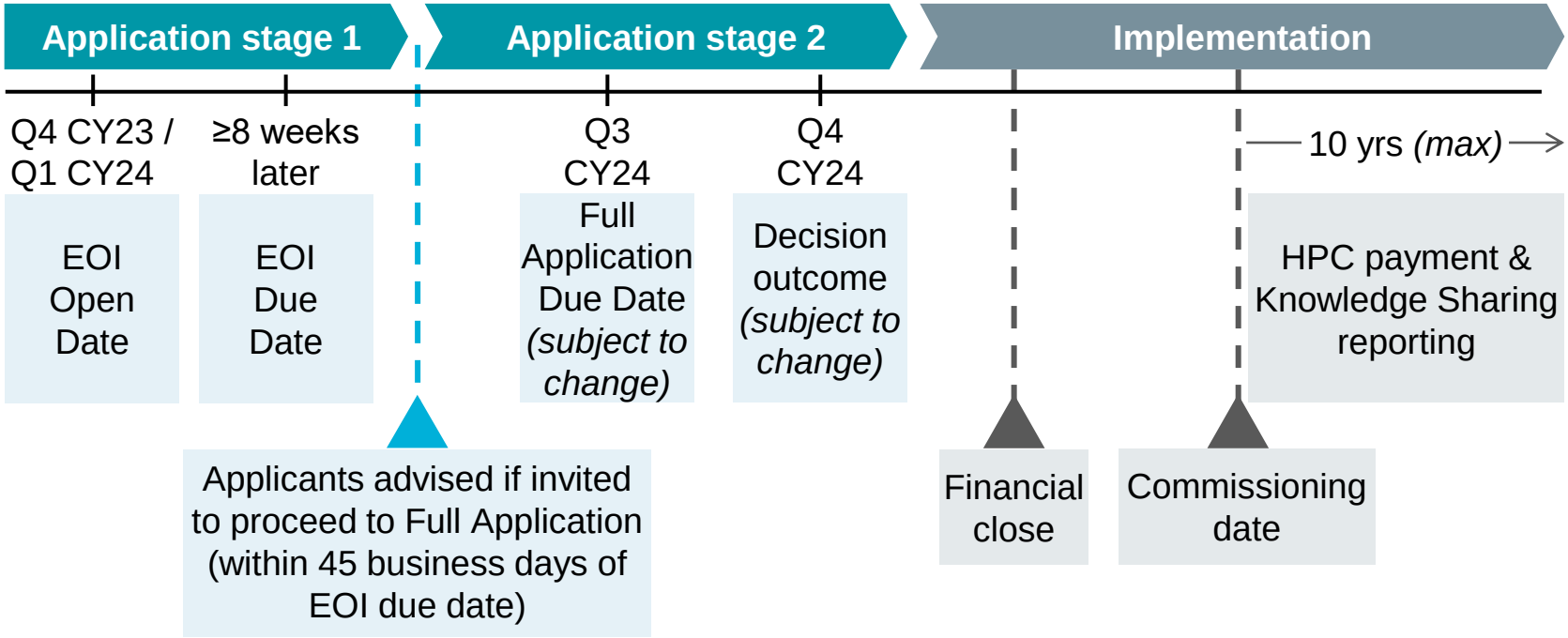
Proposed merit criteria

Merit Criterion A	Merit Criterion B	Merit Criterion C	Merit Criterion D	Merit Criterion E
Alignment to Competitive Round Objectives	Applicant Capability & Capacity	Scope, Methodology, Deliverability & Risk	Financial Capability	Knowledge Sharing

Note: Competitive Round parameters are subject to change. Information contained in these slides is indicative only.

Timetable not to scale

Proposed assessment process timetable



Dates are subject to change

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Next steps

Submit a written response to the consultation paper by 3 Aug 2023

- Review detailed consultation paper at: https://consult.dcceew.gov.au/hydrogen-headstart-program-consultation
- Stakeholders can provide a response to the consultation paper by:
  - Submitting via the DCCEEW Consultation Hub
  - Emailing: hydrogenheadstart@dcceew.gov.au
- The consultation period will close **Thursday 3 August 2023**

Stay informed via DCCEEW website

- Stay informed with the latest updates via the DCCEEW website: https://www.dcceew.gov.au/energy/hydrogen/hydrogen-headstart-program
- EOIs targeted to open in Q4 2023 / Q1 2024

Tips to maximise feedback impact

1 Submit a detailed response to the consultation paper

- Ensure your responses are detailed and contain reasoning to support your feedback if your views diverge from the proposed specifications

2 Submit details on any hydrogen project(s) you are developing

- Don’t forget to provide us with details of any hydrogen project(s) you are currently developing that may seek support under the Hydrogen Headstart Program

3 Remember: the consultation period closes Thursday 3 August 2023

- If you have additional feedback, email hydrogenheadstart@dcceew.gov.au

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Further information:
https://www.dcceew.gov.au/energy/hydrogen/hydrogen-headstart-program