bp Australia Pty Ltd
A.B.N. 53 004 085 616
717 Bourke Street
Docklands Victoria 3008
Australia

3 August 2023

bp Australia response to Hydrogen Headstart consultation paper

The Hydrogen Headstart program (the Program) will help accelerate Australia's energy transition and kickstart Australia's hydrogen industry, enabling Australia to pursue its green energy superpower ambitions. The Program clearly signals Australia's intention to position itself as a global leader in renewable hydrogen by attracting investment and giving potential customers assurance of a national commitment to a new industry and enabling other clean energy industries.

bp's response to the Department of Climate Change Energy Environment and Water (DCCEEW) and the Australian Renewable Energy Agency (ARENA) Hydrogen Headstart consultation paper draws on our experience in developing three major renewable hydrogen projects in Australia, as well as our global development experience and working with similar programs in other markets.

The proposed Program design provides a solid foundation on which to build continued action, including future Headstart rounds and a comprehensive analysis of how policy initiatives through the hydrogen value chain are connected or require further connectivity.

About bp

bp's purpose is to reimagine energy for people and our planet. Our ambition is to become a net zero company by 2050 or sooner and to help the world get there too.

Globally, by 2050, bp aims to be net zero across our entire operations (scope 1 & 2), and with the carbon from our oil and gas production (scope 3) and in the energy products we sell (life-cycle emissions intensity). For each of these, we have set short-term (2025) and medium-term targets (2030). Progress on our net zero plans is outlined in our Net zero ambition report.

Globally, we're aiming to be a different company by 2030. We've always said that the energy transition needs to be orderly. Since 2019, our capital investment in our transition growth engines has increased from 3% to 30%.

We are:

- Reducing our oil and gas production by 25-30% (from 2019 levels) by 2030 and lowering emissions while high grading our hydrocarbon portfolio and growing bioenergy.
- Investing in low-carbon energy to rapidly scale up in solar, onshore and offshore wind and develop new opportunities in carbon capture and clean hydrogen.

- Installing 100,000 EV charging points and opening more than 1,000 new strategic convenience sites worldwide.
- Progressing five transition growth businesses: bioenergy, convenience, EV charging, renewables, and hydrogen by 2025.

In Australia, bp is developing projects consistent with this global strategy:

- We are the operator of the Australian Renewable Energy Hub (AREH) joint venture in the Pilbara (with InterContinental Energy, CWP Global and Macquarie Capital and Macquarie's Green Investment Group). AREH is planned to provide green electrons and green hydrogen to help decarbonise local customers and to provide hydrogen for export, with the free, prior, and informed consent (FPIC) of the site's traditional owners, the Nyangumarta people.
- bp's Kwinana refinery site is being transformed into a clean energy hub. This is currently in front-end engineering design for the Kwinana Renewable Fuels (KRF) project. The hub includes the planned production of hydrogen known as H2Kwinana, with KRF as an anchor offtake.
- GERI, a bp-owned, multi-gigawatt scale development hydrogen and renewables project, is being planned at Oakajee in Western Australia (WA)'s Mid-West
- bp owns 50% of Lightsource-bp, an independently operated global business with a significant renewable generation portfolio in Australia.
- We have substantial gas interests in WA as part of the Northwest Shelf Joint Venture, and bp is the largest joint venture partner of the Browse gas project operated by Woodside.
- bp is working with Woodside (Operator) to develop a Carbon Capture and Storage (CCS) hub, Angel, off the coast of WA.
- Since November last year, the bp pulse brand in Australia has been growing rapidly, rolling out electric vehicle charge points.
- We're exploring options with partners to decarbonise heavy transport, including hydrogen refueling.

The Program is a welcome first step to addressing the current gap between renewable hydrogen production costs and a customer's ability to pay for renewable hydrogen. Complementing other initiatives required upstream and downstream from hydrogen production, the Program is an important initiative to create a domestic and export hydrogen market.

bp's planned hydrogen projects in Australia are backed by our global expertise in developing renewable hydrogen projects. We have provided guidance to the market that we globally aim to produce 0.5 – 0.7 million tonnes a year of primarily green hydrogen by 2030 while selectively pursuing blue hydrogen projects. To achieve this, we are accessing new segments, including the mobility and industrial sectors, and decarbonising our own hydrogen use from initially supplying our own demand and that of regional customers. We regard the future export of hydrogen as an opportunity for economic development and growth in scale. Successful approaches and learnings from similar policy developments in other parts of the world also inform our response to this Program consultation.

We are developing three renewable hydrogen projects in Australia.

<u>Australian Renewable Energy Hub</u>

The Australian Renewable Energy Hub (AREH) joint venture has the potential to be one of the world's largest renewable energy hubs, with plans to use solar and wind resources to produce green hydrogen. The project intends to supply renewable power to local customers in the world's largest mining region,

produce green hydrogen for the domestic Australian market, and export to major international users – helping countries such as South Korea and Japan to decarbonise. AREH will be a phased development and deliver up to 26GW of combined solar and wind power generation at full scale.

AREH has an opportunity to help power the Pilbara with renewable electrons and green hydrogen, with the first tranche of those green electrons from 2027. Once complete, AREH is expected to abate around 17 million tonnes of carbon in domestic and export markets annually, equating to roughly 0.5 gigatonnes (Gt) of carbon savings over the project's lifetime.

GERI

GERI is a 10-gigawatt scale development in the Mid-West of Western Australia that we see supplying renewable hydrogen and clean energy to help decarbonise existing industry and supply chains and potentially deliver a range of new low-carbon opportunities. We've been granted an option to lease land in the Oakajee Strategic Industrial Area (SIA) by the Western Australia State Government. bp has also purchased a property, Daisy Downs, near Mullewa in the Mid-West, on which we hope to begin wind and solar generation in the future. The Mid West's abundant wind and sun means the site could serve as a powerhouse of hydrogen production for both domestic and export supply – creating jobs and attracting international investment.

H2Kwinana

H2Kwinana is advantaged as an early mover in competitive hydrogen production for several reasons. It will repurpose existing refinery infrastructure, has strong demand for hydrogen in the surrounding local industrial precinct, benefits from existing grid-connected transmission, and existing jetty infrastructure enables a tangible pathway to greater scale through export.

After operating the Kwinana refinery for more than 60 years, bp made the difficult decision to cease refining operations in 2021. We have since progressed plans to transform it into an Energy Hub, with a 10,000 barrel per day renewable fuels plant and a 100MW renewable hydrogen production facility. The renewable fuels plant requires hydrogen to produce sustainable aviation fuel and renewable diesel.

The H2Kwinana project plans to start producing hydrogen in mid-2026. bp's KRF is a key anchor hydrogen off-taker and we plan to use existing hydrogen pipelines to supply local industrial customers. In Phase 2, H2Kwinana will expand its hydrogen production capacity and manufacture a hydrogen export derivative to supply trading partners in North Asia and Europe.

The development of H2Kwinana has been supported by a Hydrogen Hub Program grant of up to A$70m from the Australian Government and A$300,000 from the WA Government to support feasibility work.

High Priority Issues

Timeframe - bp strongly advocates for a timeframe that delivers the Stage 2 decision in 2Q 2024. Early projects at scale will accelerate Australia's energy transition and kickstart the hydrogen industry. These projects have a significant lead time. Our experience as a global developer of several hydrogen projects indicates that 2-3 years are needed to move from final investment decision (FID) to commercial operation date (COD). For the Program to meet its objectives, it is therefore vital that the Program timeframe supports projects taking FID in April to June 2024. The proposal for a Stage 2 decision in 4Q24 is not compatible with the government's intent for projects to produce hydrogen starting in 2026.

A 4Q24 Stage 2 decision outcome will make it infeasible for projects to start hydrogen production in 2026, and delays in a planned start-up may compromise securing offtake and capital. We encourage the government to identify areas where assessment processes and overall timeline can be accelerated without compromising the quality of assessment. As a starting point, it is vital that the EOI process starts in late 3Q23.

Hydrogen Production Credit (HPC) payment – bp encourages a flexible framework for how the HPC payment can be made. The current proposal outlines a fixed HPC per kg of hydrogen produced by the facility within a total volume cap over a 10-year period. As an alternative to a fixed HPC, the proponent-government agreement could reflect the total value of the HPC over the course of the contract term, with the timing and per kg value of the HPC optimized at the agreement stage to reflect project design, total value to proponent and government, and ultimate impact on delivering a project that meets the competitive round objectives.

Volume Risk Support – bp encourages the government to adopt a volume risk support mechanism that has been an important feature of similar models in other jurisdictions. The UK Hydrogen Business Model, for example, identified the need for a volume support mechanism at the outset, and it is a critical component of the scheme.[1] Volume risk support is important in the commissioning and start-up phases of projects and can be designed to cover defined reasons for unexpected lower demand volumes.

ARENA and DCCEEW outlined a volume risk support mechanism during public consultations. bp recognises the principle of an HPC top-up to cover costs of production excluding returns but activating only once 50% of demand is lost sets the bar too high. We encourage further discussions with proponents for the appropriate level of demand loss to base the support on. We also encourage consideration of defined incidents for risk support during the start-up and commissioning phase, which doesn't appear to be contemplated.

Upside sharing – bp supports an upside sharing mechanism as part of the Program, the details of which will need to be further developed. Given the government position on not taking downside risks of opex increases or revenue decreases, bp suggests that the materiality threshold for upside sharing should account for this, and any upside sharing should only be up to the value of the HPC and for the period of the HPC funding. We also suggest that any upside should be determined based on actual operating costs, actual capital deployed and when cost recovery (capital invested) is complete. This is particularly important given the current inflationary environment. It will be important that any upside sharing is done in a way that still allows the project to be competitive and attracts investment versus international alternatives.

Competitive Round Objectives

bp supports the competitive round objectives, which clearly articulate *why hydrogen* and the demonstrable value the sector should bring. While hydrogen production costs, capability, and ability to

[1] For further information, see from p.54 outlining several volume risk options.
Consultation_on_a_business_model_for_low_carbon_hydrogen.pdf (publishing.service.gov.uk)

execute are important, such first-mover projects should demonstrate broader benefits to local communities, industry development, and help inform the progress of future hydrogen projects.[2]

Proposed Eligibility Requirements

bp broadly supports the proposed eligibility criteria with the below clarifications:

Minimum Capacity – To ensure a scale-up from activity currently seen in Australia and to help achieve price reductions through scale, the 50MW minimum electrolyser deployment should be the capacity of the proposed project at the start, not achieved with expansion in capacity over the contract period. Projects with a lower capacity won't provide the scale necessary to deliver value-for-investment for the government, nor the volumes to deliver meaningful offtake and associated emissions reduction. Developing projects at scale and having confidence in the pipeline of projects across Australia will also support investment decisions through the local value chain and therefore increase options for building Australian capability and capacity.

The 50MW electrolyser deployment minimum should be a single site deployment, not smaller deployments spread across a network (e.g., multiple 5MW electrolysers connected across a natural gas network or hydrogen mobility network). Such a development will lead to higher unit production costs and is unlikely to have a compelling pathway to scale.

Single Site – bp agrees that hydrogen production should be located on a single site. Eligibility criteria should not preclude enabling infrastructure to be connected across sites (e.g., pipeline to connect hydrogen to offtake; renewable energy generation and transmission to connect to hydrogen production facility). Very large projects that include renewable energy generation and hydrogen production may improve project commerciality by co-locating electrolysers with renewable energy generation and gathering hydrogen via a hydrogen pipeline (instead of transmitting the renewable power to a single location for hydrogen production). This should be allowable under the single-site definition.

Technology – In principle, bp supports the government definition of renewable hydrogen. At this point in the local hydrogen industry's development, it is important not to have onerous requirements that would stifle development and setting requirements not placed on other sectors. There is no need to insist on new renewable build-out,[3] onerous temporal correlation requirements (the surrender of Large-scale Generation Certificates (LGCs) or Renewable Energy Guarantee of Origin (REGOs) created within a twelve-month period is appropriate), nor a geographic matching requirement.

Further clarification is welcome:

- While we agree the Guarantee of Origin Scheme could provide a good basis for certifying the hydrogen under the Program, it is not yet finalised. Clarity will be needed prior to assessment, particularly for the post-2030 period.

[2] bp is actively developing renewable hydrogen projects in Australia and recognises this is the avenue the Australian Government wishes to direct program funding toward. Globally, bp does have hydrogen production projects utilizing steam methane reforming and carbon capture & storage and has found that tiered government funding/support linked to carbon intensity is a way of encouraging the lowest carbon intensity hydrogen production without discouraging other low carbon technology options.

[3] bp current power strategy for its three Western Australian hydrogen projects is behind the meter and/or a commercial power purchase agreement (PPA).

- We suggest an annual surrender of LGCs or REGOs rather than quarterly would better align with the issuance of LGCs and REGOs under the Guarantee of Origin framework. It also reduces regulatory burden and better allows for managing the seasonality of renewable generation over time.

Assessing Applications

bp suggests weighting merit criteria to help ensure Program objectives are met:

- A 50MW minimum does provide scale relative to what is currently produced in Australia, but more significant cost reductions from increased scale will be realised at a greater capacity. Indeed, with additional market developments and national and global government initiatives, this could be achieved within a 10-year period. bp encourages the Government to emphasise a clear and concise *pathway to >500MW scale*. Demonstrating this pathway is important to the growth of the hydrogen sector and will help achieve the long-term success of Competitive Round Objectives 1-4. The amount of work completed at the EOI stage to assess the veracity of this pathway may be more difficult to determine but can be guided by several pieces of evidence, including the extent of feasibility work; identified land; evidence of identified and active approval processes; evidence of identified customer offtake, and demonstration of international government and customer relationships.
- bp encourages the government to consider minimum metrics / baseline for capability & capacity, project maturity, and deliverability to support applications by robust, viable proponents and reduce the time needed to evaluate all applications. With a short timeframe to meet 2026 start-up, these criteria are essential:
    - Hydrogen projects are complex and will create procurement and logistic challenges that will benefit from a proponent's ability to manage costs and schedule.
    - Being a first mover at this scale requires risk that not all proponents will be able to manage. Consideration of how these projects will be funded will be illustrative of project likelihood of success.
    - Identification of how proponents will meet long lead time items including plant and infrastructure requirements; evidence demonstrating that FEED and FID are on track to meet 2026 target start-up.

Total Funding Allocation

bp supported the Government's announcement of A$2 billion for the Program and appreciates that Australia does not have the same financial resources on a dollar-for-dollar basis as other jurisdictions. We encourage the Government to adhere to its target of supporting 2-3 projects with this funding and not to spread the funding thinly across multiple projects. This latter approach will not deliver the round objectives. While the Government cannot compete on financial resources, it can on timely urgency.

As part of its learnings through the EOI process and the National Hydrogen Strategy, bp also encourages the Government to consider how additional rounds may be rolled-out and/or alternative mechanisms identified to encourage GW scale projects.

- Demand identified through the consultation and EOI processes will likely justify additional budget allocation in the May 2024 budget. We encourage early planning for future rounds of Headstart

or similar policies because this can help support investment decisions to grow the project pipeline needed to meet Australia's decarbonisation targets.

- While the early mover projects supported by the committed funding will meet short-term demand and give the industry a much-needed start, significant investment is required to meet 2030 demand and beyond. The Australian Industry Energy Transition Initiative, for example, estimates that by 2030 Australia will require 140t tpd of hydrogen, while the opportunity for hydrogen and hydrogen derivative export is immense.[4] Demand is going to be strong in the Asia Pacific region – Australia is well positioned, but the reality of Australia's *Green Superpower* vision cannot be taken for granted.
- As the scale of projects increase into >1GW mega projects, the amount of investment required at earlier phase gates (pre-FID) likewise increases. These gates will require substantial financial commitment and hence visibility to future policy frameworks are critical to justify the spend and keep projects planned later in the decade on track.
- Continued efforts to grow government-to-government agreement between Australia and key trading partners are important. The Australia Germany Clean Energy Partnership is a leading example of how agreements can lead to tangible outcomes for both countries, and we'd be happy to support progress with other jurisdictions. Such discussions can include options for dual-sided policy mechanisms or matching of support to link supply, mid-stream and downstream.[5]

We look forward to engaging closely with you as you finalise the design of the Program.

[4] Japan for example has set a target of 3mtpa of hydrogen in 2030, Republic of Korea 3.9mtpa in 2030.

[5] For example, Infrastructure Australia could build on the National Hydrogen Infrastructure Assessment and prioritise options for infrastructure investment required to support export projects. Funding could be allocated/unlocked on the shortlisting and/or award of Australian projects applying to global mechanisms.