

Green Distilleries Application Form

Proposal Summary

1. Name of Bidder (This should be the lead organisation/co-ordinator for the proposed project)

Locogen Consulting Ltd

2. Project Name

Decarbonising the distillation process via direct fuel switching from fossil fuels to hydrogen

3. Project Lot Number?

1

4. Technology Type/Category

Hydrogen electrolyser, hydrogen boiler, hydrogen storage, wind. Energy system TRL of 6.

5. Estimated Start Date

* 01/07/2021

6. Project Duration (months)

1 19

7. Estimated End Date

* 28/02/2023

8. Total Project Cost (£)

3180000

9. Total BEIS Funding applied for (£)

3000000

10. Project Summary (please provide one or two sentences)

Install green hydrogen creating infrastructure to provide Arbikie Highland Estate distillery with hydrogen fuel for raising steam in the distillation process. This will replace the business as usual case of burning oil for distillation.

11. Public Description of the Project - The public description of the project should be a brief non-confidential description of the project that BEIS may use in online or printed publications. Please describe the project objectives and key deliverables and the expected project benefits. Maximum 300 words

This demonstrator project will implement a renewable energy system that delivers green hydrogen to displace oil for the purposes of raising steam for distillation at Arbikie Highland Estate distillery.

The innovative fuel switching project will demonstrate how hydrogen can be used as the fuel of choice in distilleries and can be integrated into existing distillery infrastructure with no disruption to the distilling process and minimal retrofit required. A wind turbine will be installed adjacent to the distillery to create hydrogen via electrolysis. Hydrogen will then be stored onsite and used in a hydrogen boiler to raise steam. The downstream distillation process will then be unaffected with no impact on product quality or volume.

The demonstrator will prove the ability for hydrogen to be used as a clean fuel alternative to fossil fuels and how renewable energy sources can be used to create hydrogen, offering a holistic renewable energy system. The result is a low carbon distillery that can be replicated across the distillation industry and applied in other industrial commercial settings with high thermal energy use. The project is situated in the north east of Scotland which has a significant opportunity to establish a world leading position in hydrogen through adaption and transition of the oil and gas sector. This project will contribute to the national ambition of creating a region with extensive capabilities in hydrogen production, storage, distribution and usage.

Eligibility Criteria

12. Eligibility Criteria

	Yes	No
1. Project Led - <i>Projects must be led by a UK based company the same company that led Phase 1. The demonstration study must also take place in the UK.</i> Is the project being led by the same company that led Phase 1, and that the demonstration study will take place in the UK?	X	
2. Technology and Transferability - <i>The technology must be directly transferable to the distillation sector, including from maltings through to maturation.</i> Is the technology transferable to the distillation sector (from malting to maturation)?	X	
3. Innovation and technology readiness - <i>This Competition is to support the development of innovative fuel switching or fuel-switch enabling technologies that are directly transferable to the distilleries sector (from malting to maturation). It is to support the development of technologies that are not yet commercial from Technology Readiness Levels (TRLs) 4 to 7 at the start of the projects.</i> Will your technology/ system be at TRL 4 – 7 at the start of the project?	X	
4. Innovation and technology readiness - <i>The focus of the Competition is to support the development of innovative fuel switching or fuel switch enabling technologies that are directly transferable to the distilleries sector (from malting to maturation).</i> <i>Exclusions: Funding will not be provided for projects where the technology development focuses on:</i>	X	

<p>- CCUS (Carbon Capture Utilisation and Storage)</p> <p>- Energy efficiency (apart from heat pumps which is in scope)</p> <p>- Switching of feedstocks, (except where feedstock provides chemical energy to drive the process)</p> <p>Does your project exclude the technologies listed above?</p>		
<p>5. Project status - BEIS is unable to fund retrospective work on projects.</p> <p>Can you confirm that your application does not seek funding for retrospective work on this project?</p>	X	
<p>6. Additionality - Projects can only be funded where evidence can be provided that innovation would not be taken forwards (or would be taken forwards at a much slower rate) without public sector funding.</p> <p>Can you confirm the funding requested from BEIS for your project cost for Phase 2 will be equal to or below £3m?</p>	X	
<p>7. Contract size - Phase 2 – Demonstration phase (SBRI): Split into Lot 1 (up to £5.99m) and lot 2 (up to £3m) with a total of £8.99m. The maximum funding available per project is £3m. If we don't receive sufficient bids (in number or in quality) to use the funding from one Lot we will reallocate funding to the other Lot if the bids in that Lot score the 60% pass mark All projects will be ranked against the assessment process and criteria (section 7). Demonstration studies must be complete by 12pm (noon) BST 15th March 2023.</p> <p>Can you confirm the funding requested from BEIS for your project cost for Phase 2 will be equal to or below £3m?</p>	X	
<p>8. Eligible project costs - SBRI is aimed at organisations working on research and development (R&D) of an innovative process, material, device, product, or service prior to commercialisation. Funding is available for R&D activities only, including related dissemination activity. Projects requesting funding for commercialisation activities are not eligible.</p> <p><i>The full list of eligible project costs is set out in Appendix 2 and outlined in Section 5 of the Green Distilleries Phase 2 Application Notes.</i></p> <p>Can you confirm that requested funding is for eligible costs only?</p>	X	
<p>9. Project end date - Phase 2 Demonstration Studies must be completed and approved by BEIS (projects need to allow for time for the BEIS monitoring officer to review the demonstration study final report and amend accordingly) by 12pm noon GMT 15th March 2023.</p> <p>Can you confirm that the project will meet the specified project end dates?</p>	X	
<p>10. Risk-Benefit sharing - The sharing of risks and benefits is an important aspect to the SBRI approach. Projects receive financial support and retain any intellectual property generated, with certain rights of use retained by BEIS. Project outputs are also expected to be shared widely and publicly and project teams are not permitted to include profit in the eligible project costs.</p> <p>Do you agree to this approach?</p>	X	
<p>11. Applicants and Project Team Make-up - The Phase 2 Demonstration project is expected to be delivered by a project team or consortium. A single project application must be submitted by the lead project member (the project co-ordinator).</p> <p><i>Members of the project team can be:</i></p> <ul style="list-style-type: none"> • Private sector companies: both SMEs and large enterprises can apply as sole applicants or as part of a consortium with other private sector companies, or in a consortium with academic, research or public sector organisations. • Academic, research, public, third sector or community organisations must work as part of a project consortium with private sector organisations – they cannot be sole applicants to this competition. <p><i>The project team co-ordinator can be a private sector company, academic, research, public, third sector or community organisation as long as they have the necessary</i></p>	X	

skills and capacity to effectively lead the proposed demonstration project and have a route to market.		
Can you confirm that your project team meets eligible organisation requirements?		
12. Planning, Regulatory and Environmental Permissions - Where planning, regulatory and environmental permits are required, the applicants must ensure that these permits will be in place to successfully complete the demonstration before the end of the Phase 2 Demonstration Study (12pm noon GMT 15th March 2023). Can you confirm that the necessary permits required to successfully deliver the Green Distilleries Phase 2 project will be in place to successfully complete the demonstration before the end of the Phase 2 Demonstration Study (12pm noon GMT 15th March 2023)?	X	

13. Delivering multiple projects - If project consortium member(s) are part of multiple successful bids they must be able to deliver on them and they must not have applied for funding for the same piece of work more than once.

	Yes	No
13 (a) Eligibility question: If you or your consortium are part of multiple successful bids would you be able to successfully deliver all projects if necessary?	X	
13 (b) Eligibility question: If you or your consortium are part of multiple successful bids could you please confirm that you have not applied for funding for the same piece of work more than once?	X	

Contact and Organisation Details

1. Locogen Consulting Ltd Contact Details

Title [This information has been redacted]
Name [This information has been redacted]
Position [This information has been redacted]
Email [This information has been redacted]
Mobile Number [This information has been redacted]
Organisation Website Locogen Ltd

2. Organisation Name

Locogen Consulting Ltd

3. The registered address of the Lead Organisation

Address Line 1 4 West Silvermills Lane
Address Line 2 -
Address Line 3 -
Town/City Edinburgh
Postcode EH3 5BD

4. County

Midlothian

5. UK Region

Scotland

6. Country

United Kingdom

7. Project Location: Is this registered address the location where the main activity of the proposed project will be carried out? If the answer is No you will be asked to provide location details in the separate Project Cost Breakdown Form.

No

8. Organisation Type

Private Company

9. Organisation Size

Small Enterprise <50 employees

10. Number of employees (including directors)

This information has been redacted

This information has been redacted

This information has been redacted

15. Balance Sheet Date (total assets net of depreciation)

* 31/12/2020

16. Is the Organisation able to recover VAT?

Yes

17. Organisation Maturity

>10 years

18. How is the organisation currently funded? (Choose all that apply)

[This information has been redacted]

19. Organisation Status: a brief introductory description of the company to set the scene for the assessors Maximum 250 words

Locogen is an independent renewable energy consultancy and developer comprising a team of professional project managers, engineers and environmental consultants with expertise in the development, implementation and monitoring of renewable and low carbon technologies. Locogen has over a decade in the design and delivery of commercial wind, solar, hydrogen, heat pump, hydro, biomass and district heating projects and therefore has the understanding of challenges in developing and operating low carbon projects which enables managing the inter-dependency of multiple technologies that may comprise an optimal energy system. Locogen provides consultancy services to help clients develop and implement low carbon solutions and also invests directly in projects in partnership with clients. Clients are wide-ranging and varied including commercial developers, public sector, third sector, community groups and private sector. Locogen works with clients to identify opportunities to invest in low carbon technologies and then provide detailed technical support through feasibility, consenting, design, procurement and construction into operation. Locogen also provide due diligence services for a number of non-recourse financial institutions and private equity firms in assessing the technical risks and financial worth of renewable energy projects. Locogen has an excellent understanding of the UK low carbon sector, including the relevant energy and environmental policies. Locogen's Managing Director, Andrew Lyle, is the vice chair and board member of Scottish Renewables and Locogen staff regularly participate in policy discussions and round-table events helping to define and push forward the development and implementation of UK energy policy and regulations.

20. Does the organisation have a parent company? (If yes you will be asked to provide details)

Yes

Parent Company Details

21. Parent Company Details

Organisation Name Locogen Ltd
Address Line 1 4 West Silvermills Lane
Address Line 2 -
Address Line 3 -
Town/City Edinburgh
Postcode EH3 5BD

22. Country

United Kingdom

23. Number of employees (including directors)

30

24. Business Registration Number

SC370060

25. Turnover Amount (in most recent annual accounts)

This information has

This information has

28. Balance Sheet Date (total assets net of depreciation)

* 31/12/2020

29. Organisation Maturity

>10 years

1. Description of novel technology, technical feasibility, replicability and performance of Green Distilleries solution

1a. Please give a high level description of the proposed Green Distilleries solution, including a description of the novel technology, its technical feasibility and its replicability. (5%) (applicants can use the upload link to provide supporting evidence and illustrations, any further text beyond the word limit will not be assessed) With reference to the Phase 1 Feasibility study, applicants are expected to: Describe the technology readiness level (TRL) at the start of the project, and at the end of the Phase 2 Project. Describe why the Green Distilleries solution is novel and how it will support the decarbonisation of the distilleries sector. Describe how the proposed Green Distilleries Solution can be replicated across the distilleries sector and the advantages of this solution over other state of the art technologies. Describe how the solution(s) work, including a description of your engineering design for the demonstration, and how it fits into distillery processes to enable decarbonisation of the sector. Provide evidence to demonstrate that the proposed approach is technically feasible, providing justifications for all technical data provided. This should reference earlier feasibility work, including engineering designs, engineering calculations and the outputs of other feasibility research Explain how the outputs of the feasibility work you have carried out to date have informed your engineering design. Explain how your demonstration project will accelerate the development of fuel switching/fuel switch enabling technologies Describe the potential challenges and barriers of the proposed solution and how they will be overcome/mitigated. (Maximum 2000 words)

TRL & Innovation

The different components that make up the engineering solution are all well-established commercial products. The innovative approach to this project demonstrator is combining these different components to provide a zero-carbon solution to process heating in a distillery setting. This project therefore benefits from offering a novel and innovative approach to decarbonising the distilling sector whilst minimising risk due to untested and untried technology components. This factor is a key advantage over other possible technological solutions to decarbonising the distilling sector.

The hydrogen infrastructure components that will be installed at the project are all readily available from multiple different manufacturers. This includes hydrogen burners (also capable of burning fuel oil and biodiesel), boilers, storage vessels and electrolyzers. The creation of green hydrogen via an electrolyser is also an established process and the use of wind power to provide the renewable energy is a mature technology.

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1b. Please give a high-level description of the performance of the Green Distilleries solution. (15%) (applicants can use the upload link to provide supporting evidence and illustrations, any further text beyond the word limit will not be assessed) With reference to the Phase 1 Feasibility study, applicants are expected to: Identify and compare the performance of their solution with other state of the art technologies Describe the technical and commercial advantages of your solution over other state of the art technologies Describe the scalability of the solution and applicability/replicability across different distillery sites (is the technology transferable to other industrial sectors?) Describe costs of the solution, providing a detailed analysis on the lifetime costs of your solution costs (including CAPEX and OPEX) comparing these costs to other state of the art technologies. Describe how the solution will impact product quality, costs and output. Identify any uncertainties associated with these cost estimates and how the design and execution of your demonstration study will address these uncertainties Explain the impact the solution would have on a site in terms of health & safety, air quality, fuel delivery logistics and production disruption and how the applicant will ensure the necessary risk assessments and training will be carried out. (provide a qualitative and quantitative comparisons to these impacts relative to the current state of the art technologies) Explain where planning permission/environmental permits are required, the applicant must justify and provide reasoning as to how these permits will be in place to successfully complete the demonstration before the end of the Phase 2 Demonstration Study (12pm noon GMT 15th March 2023) (Maximum 2000 words)

Comparison against other state of the art technologies

Hydrogen as a fuel source is well understood and has been proven in many industrial settings. Commercial hydrogen burners, boilers and storage vessel products are all readily available and the creation of green hydrogen via an electrolyser is an established process. The different components required to construct the engineering solution are 'off-the-shelf' products and can be procured, constructed and installed with relative ease. This factor is a key advantage over other possible technological solutions to decarbonising the distilling sector.

The use of hydrogen burners is extremely adaptable and scalable and can therefore be applied across the country to distilleries of differing sizes and geographies. The engineering design can also be applied to other industries using process heat.

The combustion of hydrogen creates only heat and water as a by-product. There are therefore no carbon emissions associated with the burning of hydrogen. Therefore, the novel project has a positive impact on air quality and the surrounding environment compared to a business as usual scenario.

Renewable energy can be used to produce hydrogen through electrolysis. The switching of fuel from oil to hydrogen offers the exciting opportunity for integration of renewable power into the distillation process to fully decarbonise the operational distillery. Renewable sources of power can be obtained through development of onsite renewables, through potential private wire arrangement from nearby operational assets or importing green hydrogen via transported containers from production elsewhere. There is a distinct opportunity for onsite electrolysis at distilleries as they already have an available water source for making their product.

This project also acts as a critical stimulus for a regional and even national hydrogen economy. Angus, Dundee and Aberdeen Councils all have ambitious hydrogen transition projects, with a fleet of hydrogen buses already operating in Aberdeen and Dundee. There is a demand for hydrogen in the area, which can be satisfied by the excess hydrogen produced by this project. This provides the confidence in other hydrogen generation projects with ready off-takers available. This will have an enormous cumulative impact on carbon emissions from transport and industry, which can then begin

to transition to hydrogen, which is aligned with the UK Government's Hydrogen Pathway to Net Zero. Rollout potential policy context is presented in Appendix K of the Phase 1 report.

Alternative technologies: Heat pumps also present a low carbon option for distilleries. Systems have been developed which are able to raise steam, but at lower pressures than the design of most currently utilised stills, which therefore require refurbishment or replacement of the still. Where high temperature systems are available, they are also not able to operate with rapid ramp rates utilised on most current distillery processes, and therefore require either large steam accumulators or modifications to the process methodology. Depending on the type of heat pump to be used, site specific conditions may limit the utilisation of industrial heat pumps across the industry.

Biomass and biofuel systems have also been utilised on other distilleries to reduce carbon emissions in replacement of oil-fired steam systems. Fuel supply and transport is a key limiting factor in the feasibility of these schemes, and both still have considerations related to local air quality. The low carbon credentials of these fuels are also questionable as they must be sourced from sustainable plantations. Though such a system may work for a single distillery, the scale up would demand excessive quantities of land and would have the potential to create significant land use conflicts. Lack of available land within the UK to support wide adoption of biomass would lead to sourcing abroad which would result in increased carbon emissions from transport and would not add any value into the UK economy.

Electric steam boilers are another option for decarbonisation to switch distillery energy dependence from fuel oil to electricity. When using commercial electricity rates, the running costs for this option is however extremely expensive. The carbon savings are also modest given the equivalent carbon content associated with grid imported electricity at present, although this will reduce over time. Onsite or private wire electricity from renewable energy sources could be used to provide zero carbon electricity, however the intermittency of the resource would require an onsite energy storage.

Scalability, replicability and applicability in distillation and other industry

Hydrogen offers ease of scalability as a substance and has a greater calorific content than gas oil (33 and 13 kWh/kg respectively). Distillation is responsible for 88% of emissions within the distillery sector, with 56% of energy being supplied by gas, 19% by oil fuels, 17% mains electricity and the remaining a mixture of biomass and renewable electricity.

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Quality and costs

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Barriers

The distilling sector is traditionally heavily resistant to change which is often down to fear of jeopardising their end product quality and brand. Despite there being vocal support of transitioning to renewable energy, distilleries have been reluctant to part with their own money in a novel design. This principal barrier can be overcome by using the Green Distilleries grant to showcase the solution at an independent working distillery. Proving the technology works at this scale through Phase 2 will provide the confidence the wider industry needs for widescale adoption whilst minimising risk of expenditure to BEIS by limiting the size of the technology. The technology is easily scalable and therefore the technology can be increased in size once investor and purchaser confidence is achieved.

A key barrier to full commercialisation is the availability of low carbon hydrogen in the UK. There are many examples of production facilities but there is yet to be the industrial scale production that the country needs to achieve its Net Zero 2050 target via the Hydrogen Pathway. This project can be seen as a crucial opportunity for the UK government to invest in a scheme that creates a route to market for hydrogen which will improve the business cases for hydrogen manufacturers. This is discussed further below.

Hydrogen policy

In addition to the UK government's binding Net Zero 2050 target, the project aligns in numerous ways to other policy. The project directly advances Point Two of the 10 Point Plan of 'driving the growth of low carbon hydrogen', where the UK aims to deliver 5GW of low carbon hydrogen production capacity by 2030. Arbikie can operate as a touted 'SuperPlace' combining industry, renewable generation and hydrogen production to supply the wider region with green hydrogen to decarbonise transport and other industrial settings. With the project acting as a catalyst for a hydrogen economy, Point 1: Advancing offshore wind and Point 4: Accelerating the shift to net zero emission vehicles are also satisfied.

Building on the Ten Point Plan, the 2020 Energy White Paper provides the strategy for transforming the wider energy system and supporting a green recovery. Given the project's strategic location in the north-east of Scotland and proximity to the North Sea oil and gas sector, delivering a hydrogen hub will support companies and workers to move away from oil and gas into the future energy landscape under a just transition. This will help to build back better by future proofing the north east energy sector against future volatile fluctuations in the oil and gas markets.

Chapter 6 of the UK's Industrial Decarbonisation Strategy set outs support for innovation in fuel switching technologies, including hydrogen. This project satisfies the deployment of low-regret hydrogen fuel switching to transform industrial processes and aligns with the government's ambition of replacing fossil fuels with hydrogen (and other low carbon fuels) of 20TWh/a by 2030. The Climate Change Committee's 6th Carbon Budget (whose recommendation of 78% reduction in carbon emissions by 2035 was recently adopted by the UK government) includes the shift of UK industry to

low carbon hydrogen and upscaling of low carbon hydrogen supply within two of the four key recommendations.

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2b. Please provide figures for the estimated carbon savings generated by your Green Distilleries solution and explain the wider benefits that your Green Distilleries solution will contribute to. (10%) (applicants can use the upload link to provide supporting evidence and illustrations, any further text beyond the word limit will not be assessed) With reference to the Phase 1 Feasibility study where applicable, applicants are expected to describe the commitment your organisation will make to ensure that opportunities under the contract deliver Social Value Policy Outcomes, via the following: Estimate the potential

emissions savings from the solution and provide the basis behind the calculation for your site and if replicated across the distillery sector/other industrial sectors. Please provide further justification and reasoning behind calculations used to calculate carbon savings attached as an Annex as part of your application form. Describe how the emissions savings will contribute to the UK's Net Zero by 2050 target. Provide information about job creation and other benefits generated because of the Green Distilleries proposal, including those beyond the Green Distilleries competition. Describe how the project will benefit and impact the local environment and community beyond the Green Distilleries Competition Describe how the project supports the Government's plans of "Build back better" and "levelling up" of the economy (Maximum 2000 words)

Project carbon

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UK & Scotland hydrogen policy and wider rollout

The potential for fuel switching to hydrogen is not limited to the distilling sector. Hydrogen is anticipated and projected to be a crucial fuel of the future low carbon energy mix in the UK, tackling the industry, heat and transport sectors specifically. This is part of the Hydrogen Pathway to the UK Net Zero 2050 (and interim 78% by 2035) target. Heat is the largest energy consuming sector in the UK accounting for 44% of final energy consumption and 37% of UK carbon emissions. Transport is the largest contributor to carbon emissions with industry being second accounting for 110 MtCO₂e/a of carbon. Hydrogen is able to tackle all these critical sectors to help reach the UK's Net Zero target.

Industry: There are processes that require high temperature heat that are presently met by fossil fuels, where hydrogen can provide an efficient alternative where it can be generated and stored on site. This is particularly the case where the high temperature heat demand is intermittent and provision of adequate electrical supply capacity to meet these peaks is problematic and / or cost prohibitive. This situation is directly applicable to distilleries but also includes welding or metal forming and major chemical and materials industries.

Hydrogen has the ability to store energy and provide generation and high temperature thermal energy when required. Through the installation of hydrolysers, storage and generation at strategic locations within the national grid network, most likely through the adaption of existing gas peaking plants, excess supply can be converted to hydrogen and stored to be used to fuel peak demands. At a more local level, this use of hydrogen can also be a route to replace diesel back-up and peaking generation on more remote or independent grid networks.

Heat: Another potential role for hydrogen in the decarbonisation of UK energy which is through its use to displace natural gas as a piped fuel to homes and businesses for use in space and water heating in conventional gas boilers. On the face of it, the conversion of electricity to hydrogen, pumping it to point of use and then burning it to generate low grade heat would appear inefficient when compared with using the electricity in an air source heat pump. However there is such a large embedded investment in gas infrastructure that this may be an expedient route to achieve the high level of take up needed to meet the UK's necessarily ambitious carbon reduction targets.

Transport: Hydrogen offers an effective alternative to diesel fuel for large transport such as buses and road freight.

In all these instances, availability to green hydrogen as well as transport and storage to point of use and purchase for a competitive price are all barriers to uptake. The implementation of a green hydrogen energy system for provision of industrial heat gives industry and investor confidence in applying the technology in these other areas.

The location of the demonstrator project is of national strategic importance to the realisation of a hydrogen economy, given the proximity to the UK's oil and gas sector and North Sea offshore wind developments. The volume of hydrogen that can be used at the site will be limited by the size of the storage vessel. When excess hydrogen is created that cannot be stored onsite then this can be sold to third parties. Through the cost-effective production of green hydrogen, the project will be able to accelerate the expansion of the hydrogen economy in Aberdeen, Angus and Dundee.

Aberdeen has had a commitment to hydrogen for some time, having published its Hydrogen Strategy and Action plan in 2015. This focus has continued with publication in May 2020 of a Net Zero Vision and Infrastructure Plan for the City. This puts a strong dependence on the ability for Aberdeen and Angus to develop as a hydrogen production and storage hub and through this delivering hydrogen for heat and transport.

Within this positive policy environment there are a number of specific initiatives/projects that are underway or in advanced planning. Aberdeen City Council approved the creation of a Hydrogen Hub in the city in October 2020 and has a fleet of hydrogen buses. This initiative sets out the plan to deliver the hydrogen production and storage element of the strategy with the Hub operational by the end of 2022. Whilst the initial focus of the Hub is providing transport fuel for public service vehicles (PSVs), the ambition is also to explore uses in industry and for local heat.

Angus Council commissioned Cenex to assess the transition of their vehicle fleet to low carbon alternatives. This study is expected to be completed in March 2021 and early indications are that the report will conclude that fuel cell electric vehicles (FCEVs) are the most suitable technology choice for heavier vehicles (e.g. bin lorries, trucks and large vans) due to the improved energy density, of hydrogen over batteries. The report also identified that the pattern of use of many smaller vehicles within rural local authority fleets, for example the longer miles travelled and overnighting at employee residences, may also suit FCEV vehicles better. It is likely that the outputs of this assessment will demonstrate a significant requirement for FCEV and help guide the future vehicle strategy of the Council as they move towards meeting the target of cutting council fleet emissions to Net Zero by 2030.

Job creation and other benefits

A recent survey by Scottish Renewables found that over 75% of offshore oil and gas workers would be willing to move to the renewables sector but that there are limited opportunities to do so. Additionally, 91% of respondents had not heard of the term “just transition”, which is an approach to protect workers’ rights and ensure social equality during the transition from a fossil fuel based economy to a sustainable, low carbon one. A hydrogen economy would have an enormous benefit to the UK economy by finding skilled workers jobs in industries that help in achieving climate change targets, ensuring a just transition by protecting long term employment. Given Aberdeen and the surrounding areas’ dependence on the oil and gas industry, the importance of a just transition to a hydrogen economy cannot be understated. As well as providing a low carbon alternative to the current Aberdeen energy industry, long term future work prospects could be secured, avoiding damaging wider social implications from economic depression. As the UK recovers from the COVID-19 pandemic and wrestles the concurrent climate crisis, the North Sea oil and gas industry must be transitioned and the implementation of a local hydrogen project aligns with the government’s “build back better” ethos.

The advancement of the hydrogen economy will have important international consequences for the UK. The Committee on Climate Change identified potential industrial opportunities for the UK from being an early mover in hydrogen engineering and technologies with benefits of creating a local supply chain and exporting product, knowledge and creating jobs.

Having an energy source created locally greatly reduces the risk of external factors determining the price and availability of supply. Fossil fuel prices have historically been extremely volatile and uncertain. They are tied to external political influences and it can be hard for a business to financially plan for the future if they are dependent on fossil fuels. With the ever-increasing pressure on governments to take further action to decarbonise and replace fossil fuel reliance there is also a future risk of increased costs of emitting carbon, purchasing fossil fuels, omission from future certifications marking carbon credentials and the possibility of an outright ban. Displacing fossil fuels with hydrogen presents an opportunity for future-proofing the site against inevitable price increases and destabilisation of supply. Having this security will allow Arbikie to forecast expenditure without additional uncertainty and retain and expand its workforce. Arbikie are a very important employer in the area, not just at the distillery but as a working farm, providing crucial employment opportunities in a rural area.

2c. Please provide a description of your dissemination plan for your Green Distilleries solution. (10%) (applicants can use the upload link to provide supporting evidence and illustrations, any further text beyond the word limit will not be assessed) Applicants are expected to: Identify the relevant stakeholders, including plant manufacturers and suppliers, end users, trade bodies and academia Provide a dissemination plan, including a timetable for any dissemination activities, describing how the learnings from the demonstration study will be shared with industry. The plan should include key stakeholders, lessons learnt, and any challenges faced during delivery. Describe how the outputs of the demonstration study will be disseminated beyond the end of the Green Distilleries Competition (15th March 2023) (Maximum 1000 words)

An iterative and ongoing dissemination plan will be implemented for maximum industry penetration and impact. A “Dissemination Strategy Project Plan” is attached to this submission and shows timelines and events.

Locogen, Logan Energy and Arbikie have already completed joint and individual press releases following the BEIS announcement of the successful Phase 1 competition projects. The joint press release was distributed across multiple platforms, websites and industry and regional press. Unprecedented traffic volume occurred on the Locogen website and LinkedIn pages.

The Phase 1 report is due to be published by BEIS on 15th May to coincide with World Whisky Day and the project partners will produce press releases through national and industry press as well as through social media channels to coincide with this announcement, for maximum exposure.

Locogen have submitted two entries to the All Energy Conference (18th – 19th August) for webinars covering the project. These are entitled:

- “Decarbonising the distillation process via direct fuel switching from fossil fuels to hydrogen” and
- “Technical solutions for decarbonising the distilling sector”

Learnings from the project solution will be used to illustrate the environmental and techno-economic benefits and how other distilleries and industry at large can also transition. In particular, presentations will cover key outcomes as well as technical, financial, stakeholder and logistical issues and how these can be overcome.

In the lead up to these presentations, the project partners will advertise the webinar to all industry contacts including distilleries, industry and hydrogen engineering companies, encouraging attendance. Webinars will be recorded and available for future referral.

Arbikie and Locogen have close ties to the Scotch Whisky Association and the Institute of Brewers & Distillers (IBD) and will therefore propose hosting webinars for distillery owners, developers, operators and investors to attend and share in knowledge that has arisen from Phase 1 and ongoing progress with Phase 2. Locogen have also targeted Heriot Watt University as opportunity for disseminating knowledge, given their world-renowned experience in distilling and brewing and close proximity to Locogen and Logan Energy in Edinburgh. Presentations to lecturers and students would ignite interest in hydrogen as a fuel within the drinks manufacturing sector and allow for greater research to be

and will showcase the solution to other members, which will generate enormous interest across the industry.

Webinars will be arranged upon completion of Phase 2 and following a sufficient period of monitoring performance, scheduled to be 12 months since commissioning.

In the wake of the press releases, there have been numerous enquiries made from other distilleries interested in the technical solution offered and wanting a similar decarbonisation strategy implemented at their site(s). Locogen have submitted proposals for other distilleries to look at hydrogen as a fuel for decarbonisation, combined with onsite renewable generation.

Logan Energy's influence in the hydrogen industry has successfully made other companies involved in hydrogen interested in this potential route to market for green hydrogen and deployment of hydrogen infrastructure.

Marketing materials have been created covering the following areas:

- Description of the green hydrogen solution and Arbikie Highland Estate Distillery;
- Integration of the hydrogen fuel into an operation distillery;
- Creation of hydrogen using renewable energy developed onsite;
- Carbon savings compared to a business as usual case; and
- Business case of the creation of a zero carbon distillery.

Planned dissemination activities upon completion of Phase 1 and award of Phase 2 will include:

- Presentation of findings to BEIS;
- Locogen Press Release for report launch;
- Social media campaign, including LinkedIn;
- Joint public webinar with all project partners;
- Locogen webinar with distilleries – Working through members of the Scotch Whisky Association and the Institute of Brewers and Distillers. Targeting distillery owners, developers, operators and investors to attend and share the knowledge and learn how they too can benefit from the carbon and financial savings;
- Logan Energy dissemination to the UK Hydrogen & Fuel Cell Association;
- Individual conversations with distilleries and other industry operators;
- Arbikie will use their own marketing to publicise the transition to a low/zero carbon distillery and promote this in their products. The technology will be showcased on tours and website space will be dedicated to the zero carbon solution; and
- Promotion of report and findings to both technical (e.g. renewables) and industry (e.g. whisky / distilling press).

Locogen's Managing Director, Andrew Lyle, is acting chair of Scottish Renewables and Locogen are therefore excellently placed to contact the wider renewables industry to accelerate the uptake of low carbon and hydrogen solutions to the decarbonisation of the distilling sector and wider industrial processes. Logan Energy are members of the UK Hydrogen & Fuel Cell Association and will use established contacts within this membership to circulate information about hydrogen's role in decarbonising distilling and how these learnings can be applied to other industries and integrated with the Hydrogen pathway to Net Zero. Access to these member organisations will allow for dissemination across the whole supply chain, from manufacturers to developers and industry producers of goods.

Locogen, Logan Energy and Arbikie are all active in a number of social media channels such as LinkedIn, Twitter and Facebook and will share and discuss the various findings on these platforms.

To provide supporting evidence and illustrations upload your file/s here. Please do not upload any further text in order to go beyond the word limit, it will not be assessed. Max upload size per file - 10MB Max number of files - 5

- File: Dissemination Strategy Project Plan.pdf - [Download](#)

3. Project Financing

To accompany your application you must upload the Green Distilleries Project Cost Breakdown Form here. Max upload size per file - 5MB Max number of files - 1

- File: Green Distilleries Phase2 Finance Form.xlsx - [Download](#)

3a) With reference to the Phase 1 Feasibility study and how the Phase 1 Feasibility study has helped firm up these costs, applicants are expected to: Fully fill in the Green Distilleries Phase 2 project finance form. Clearly demonstrate that the project can deliver a workable solution (including the use of modelling or demonstration). Provide clear reasonings to the overheads and eligible costs Provide reasonings and justifications behind cost estimates, including any contingency and assurance planning for costs (please attach any evidence in terms of letters of support, contracts, existing agreements along with your Phase 2 application). Provide a detailed description of major cost items greater than £10,000. Justify costs and provide certainty of availability and assurance of costs provided for materials, equipment and products that are required for the Green Distilleries Phase 2 Project. BEIS normally calculates overheads as a fixed percentage of all direct labour costs at 20%, but in exceptional circumstances the overhead rate could be higher, applicants will have to justify overheads above this percentage, this must be fully detailed in the application. (Maximum 1000 words)

Locogen and Logan Energy conducted full techno-economic modelling as part of the Phase 1 feasibility work. Energy flow modelling (Section 2.1.2 in Phase 1 report) showed what size of system would be required to deliver a distillery that could completely (99.5%) transition from dependence on fossil fuels to green hydrogen produced onsite. The capital cost for this size of system greatly exceeded the capital grant available from the BEIS Green Distilleries competition. Raising the additional capital is possible but would require confidence in outside private investors, or from other public funding sources, that the initial demonstrator works. The engineering design is well understood, with all individual components having a technology readiness level of 9 or above. It is the combination of these components into a distillery setting that is innovative and transformational to energy use across distilling.

The Project Team propose developing a demonstrator system at a smaller scale in the first instance, so that the capital funding can be used to prove the working concept and increase confidence to outside investors. Modelling for the demonstrator scale system found that up to 48% of the annual energy demand for distillation could be satisfied by green hydrogen produced onsite. Once the Phase 2 demonstrator project has been monitored and optimised, the upscaling to a 100% green hydrogen system will commence, which will be done by attracting outward private investment. This is discussed in more detail within Appendix D of the Phase 1 report.

Wind

[This information has been redacted]

[Redacted text block containing multiple lines of blacked-out content]

[This information has been redacted]

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[This information has been redacted]

To provide supporting evidence and illustrations upload your file/s here. Please do not upload any further text in order to go beyond the word limit, it will not be assessed. Max upload size per file - 10MB Max number of files - 5

- File: Letter Of Support - Element 2.pdf - [Download](#)

3b) Value for money to HM Government - Please describe how your Green Distilleries solution represents good value for money for HM Government. (15%) (applicants can use the upload link to provide supporting evidence and illustrations, any further text beyond the word limit will not be assessed) Applicants are expected to: Provide evidence for the additionality achieved with this funding. Demonstrate a fair balance of risk and benefits for BEIS, including no element of profit in the project costs. Describe why the proposal represents good value for money for HM Government, where costs are realistic and justified and are likely to secure the expected project aims and deliverables, including the selection and costing of suppliers and subcontractors. The answer should explain the following: How the availability of public funding makes a material difference to the actuality and pace of moving the solution towards commercialisation, and Qualify and quantify the savings that are being passed on to HM Government to reflect the asymmetric balance of risks and benefits accruing to the project consortium and HM Government. (please refer to Risk-Benefits sharing Section 4 (10) of this application guidance form). As part of the assessment process for Phase 2, project teams will be asked to clearly state, where cost savings are being provided compared to exclusive development contracts. These cost savings form part of the eligibility conditions for the Competition, i.e. projects that do not offer justified cost savings will not be eligible for Phase 2 funding. (Maximum 1000 words)

The Scotch Whisky industry, and wider distilling sector, has been historically reluctant to change. This is principally borne of fear of jeopardising their product quality or brand integrity and narrative, which is so fundamental to the success of the UK's premium drinks globally. There is an understanding for the need to decarbonise, which is being promoted through SWA's Sustainability Strategy to achieve net zero carbon emissions by 2040. Certain distillery owners are intent on decarbonising but lack the knowledge, experience and confidence to do so. Obtaining financial support through the Green Distilleries fund is essential to accelerate the delivery of the project and showcase a workable decarbonising solution to increase the overall scale of ambition across the industry.

The hydrogen fuel-switching solution benefits from its relative simplicity through ease of integration with existing distilleries' infrastructure. By implementing the dissemination strategy of the Phase 2 demonstrator, the success of the project will cause widespread adoption of green hydrogen as a fuel for distillation.

The credibility of the project that is gained through securing Green Distilleries support, following such a rigorous and competitive process, will increase the confidence of outside investors and lenders to back the business plan and supply the capital for developing Phase 2 demonstrator to the full-scale operation. The Green Distilleries funding will be the catalyst to secure further funding from the investors and for future further commercialisation. Without the support of the Green Distilleries funding, it would be difficult for the required funding to be raised to deliver such an innovative and replicable project, and certainly not to the desired timescales.

The undertaking and completion of Phase 2 will establish a showcase hydrogen distillery, securing important knowledge and experience in the process and firm up any capital and operational cost assumptions. Minor technical details can also be optimised to allow for the most efficient energy system. Learnings and any risks encountered along the way will be well understood and robust mitigation plans introduced to streamline the process from inception through to operation. Having a completed feasibility study and demonstrator project complete and operational will provide evidence to other investors as to the capability of the product and give other distillery owners the confidence and peace of mind that their investment in the technology will save greenhouse gas emissions and money. The ability to market and disseminate the project to wider industry, outwith the distilling sector, will accelerate the adoption of the technology into other process heat industries, thereby further improving investor confidence, driving down costs and promoting the local and domestic supply chain. A successful Phase 2 demonstrator project will incentivise the wider hydrogen economy into upscaling production efforts with a viable route to market. This acceleration and market impetus is required for the hydrogen pathway to contribute towards the UK Net Zero 2050 target.

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This project offers an excellent investment opportunity for HM Government as it will aid in the UK's Net Zero 2050 target and improve industry prospects of being part of a just transition to a low carbon economy. Allowing the UK's industries to transition to hydrogen fuel will have an enormous impact on national carbon emissions and establish the UK as a world leader in hydrogen production, infrastructure and knowledge which can be exported abroad. Having a domestic market with a demand for hydrogen will drive the transition from oil and gas to hydrogen via steam methane reforming (SMR) and offshore wind generation. Having a healthy and booming hydrogen industry will allow for the increased uptake of hydrogen transport and heating as well as industry. Thereby, decarbonising the UK's top three emitting sectors. In addition to increasing the overall installed capacity of renewables and having a major positive impact on decarbonising the UK's second highest greenhouse gas emitting sector, the creation of a hydrogen industry will allow for a just transition to a low carbon economy by giving workers the opportunity to (re)train as skilled engineers and as workers indirectly employed in the hydrogen economy. This project therefore represents HM Government with the opportunity to invest in the technology now to realise long term climate and economy goals.

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through government grants or community group funds due to a true desire to realise successful projects and see a world where everyone has access to clean and affordable energy. No profit is included within project costs and overheads are at 20%. Logan Energy Ltd have adopted the same rates as Locogen.

4. Project delivery and teams

4a. Project team and Organisation – Please provide a description of your project team and organisation for the Green Distilleries Phase 2 Demonstration Study. (10%) (Please attach any CVs to the application prior to submission) (applicants can use the upload link to provide supporting evidence and illustrations, any further text beyond the word limit will not be assessed) Applicants are expected to: Identify the skills and competencies necessary for each task. Provide an organogram mapping skills, competencies, roles, and responsibilities (including percentage of overall time that key members will be dedicating to the project). Outline the key roles for each partner and the proposed governance arrangements between the partners to ensure effective project delivery. List any external parties responsible for delivering goods or services worth more than 10% of the total project value and explain how they will ensure that these parts of the project do not give rise to delays in the delivery of the project. Guarantee access to any necessary specialist facilities, operational knowledge and skills, or other resources required to execute the project. Provide details of the relevant skills, qualifications, and experience of main project team members including descriptions and evidence of previous relevant work carried out. Include brief details of relevant previous projects, including the date, location, client and project size. Provide brief CVs of lead individuals within the project team in an Appendix to the Application (CVs should be no longer than 2 pages each). Have a strong delivery team with proven experience of successfully delivering comparable projects. (Maximum 2000 words)

The Project Partners comprises Locogen, Logan Energy and Arbikie Highland Estate Distillery (Arbikie). Locogen and Logan Energy are the Project Team due to the technical experience each offers. Arbikie are critical to the success of the project by offering a site committed to the deployment of the Phase 2 demonstrator and future expansion. An organogram is attached to this submission which shows the inter-relationships between the different team members and Partners.

Arbikie are an operational distillery that presently use gas oil as their fuel to raise steam for the distillation process. Arbikie are an independent family-owned distillery located on the working Arbikie Highland Estate farm. Provenance, traceability and sustainability are integral to Arbikie's ethos which is one of 'field to bottle' with all ingredients for their spirits planted, grown and harvested on the farm and all water taken from a naturally fed private reservoir. Arbikie are determined to find a low carbon alternative to gas oil to further improve their sustainability and environmentally conscious credentials.

Locogen is an independent company comprising a team of professional project managers, engineers and environmental consultants with expertise in the development and implementation of low carbon generating technologies.

Locogen has an excellent understanding of the UK low carbon sector, including the relevant energy

This information has been redacted

Scottish Renewables and Locogen staff regularly participate in policy discussions and round-table events helping to define and push forward the development and implementation of UK energy policy and regulations. By ensuring close contact with policy makers and industry, Locogen are strongly placed to identify grant funding opportunities and other financial incentive routes. Locogen designs and delivers hydrogen, district heating, low carbon heating solutions, wind, solar and hydro projects and therefore have the understanding of challenges in developing and operating low carbon projects which enables managing the inter-dependency of multiple low carbon technologies that may comprise an optimal energy system.

Locogen have used their considerable experience in delivery, project management and financial appraisal of renewable energy projects across the UK to access grant funding on behalf of many clients including via LCITP, BEIS and CARES. Locogen have devised, conducted the options appraisal, feasibility study, business case and project managed these projects through to commissioning and operation. Locogen have successfully project managed the construction of over 50 wind and solar projects, totalling over 50MW of installed capacity. In addition, Locogen are contracted to provide operational asset management services for over 70MW of operational wind and solar schemes.

They are experienced as a developer in their own right as well as having extensive involvement in supporting clients to identify, progress and secure finance ahead of the construction of low carbon projects. Over the last 10 years, Locogen have worked to secure £15m in external private and bank funding for their own development projects and continue to develop schemes despite the loss of renewable subsidies (Locogen's most recent wind project having been developed as a joint venture and constructed in late 2020).

Locogen provide technical support for the development and financing of renewable energy projects for the following:

1. Developers – Locogen has acted as Owner's engineers through the due diligence process on behalf of private companies/individuals and community organisations to deliver renewable energy projects. To date we have acted as borrowers' engineers for over £50m of projects that have successfully secured pre-construction finance;
1. Lenders - Locogen are on the Technical Advisory panels for Close Brothers and Clydesdale Bank and have also completed Lenders TA works on behalf of Triodos, Santander, RM Capital and Deutsche Bank (on behalf of EEEF); and
2. Buyers - Locogen has provided technical advisory services to investors looking to purchase wind and solar energy sites that are already in development or operational. To date Locogen have supported the successful acquisition of over 40MW of pre-construction and operational renewable energy projects.

Logan Energy has extensive experience and a proven track record in delivering projects and solutions in the hydrogen and clean energy sectors. Based in the UK and the Netherlands, they specialise in the delivery of integrated engineering solutions incorporating hydrogen technologies, including production, refuelling, storage, distribution, and fuel cells.

Logan Energy is a team of qualified engineers and experienced commercial professionals who are used to delivering optimally sized hydrogen systems to maximise future return on investment. They offer turnkey service from project inception and feasibility to design, development, manufacturing, installation, operation and maintenance. Logan Energy are manufacturer independent and are able to analyse and select any appropriate equipment based on proven experience in delivering hydrogen energy projects. They have not only undertaken appraisals and feasibility studies to identify viable solutions for both cost-effective hydrogen production and use but have then deployed equipment which has provided invaluable feedback into future designs, manufacturing, and operation.

Logan Energy's in-house economic models capture the evolution of hydrogen technology, (electrolysis, compression, storage and fuel cells), the cost and subsidies for wind and solar energy production and the cost of transporting and distributing hydrogen as a compressed gas. These models allow the optimisation of the hydrogen systems in combination with conventional technologies to meet the system objectives, be that maximising carbon reduction, return on investment, or other drivers, while maintaining the operation of the system to the strictest safety standards.

Project Management

Locogen's project management approach has been developed over time based on experiences on

In any project being undertaken over an extended period, such as this one, the importance of contingency and resilience in staffing is essential. The following contingency has therefore been devised:

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4b. Project Plan - Please provide a project plan for your Green Distilleries Phase 2 Demonstration Study, including any work packages and milestones. (10%) (applicants can use the upload link to provide supporting evidence and illustrations, any further text beyond the word limit will not be assessed) Applicants are expected to: Complete Table 4a (project work packages), outlining in detail the key work packages for Phase 2. Complete Table 4b (project milestone and deliverables), outlining the project milestone and associated deliverables for Phase 2. Download the excel spreadsheets through the link below. Once you have completed the forms please save it locally. The tables can then be uploaded using 'choose file' option after the question box. Table 4a - Project Work Packages Table 4b - Project Milestones and Deliverables Present a well thought-out, robust, credible, project plans. Provide a detailed plan to include any contingency planning for risks, costs, time and resources. Provide a separate high-level Gantt chart or outline project plan listing the key tasks and timescales. Provide stage gate review points in the project life that captures key project milestones/risks. (Maximum 2000 words)

The project plan is separated into six discrete and inter-locking work packages. All work packages, milestones and tasks are presented in "Green Distilleries Phase 2 Gantt Chart". This captures key tasks and timescales associated with delivering the Phase 2 demonstrator. The timeline has been devised with respect to the final commissioning deadline of 15 March 2023 has been drawn up with a conservative approach so as to provide a later than expected project finish. The project plan has in-built contingency so the programme can be flexed as required for the event of unexpected delays outwith the control of the project team.

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WP6

The performance of the technology will be evaluated against expectations and improvements to the design and/or controls altered as necessary to improve performance. Conclusions about final design will be drawn from experimentation and operational costs fully documented to obtain a clear understanding of the technology's commercial performance. The proportion of hydrogen used compared to gas oil will be closely monitored and compared against expectations. The replicability of the final engineering design solution will be assessed and commented upon to discuss how it can be applied across other distilleries and industry. Findings from the monitoring and reporting campaign post-commissioning will form part of the overall dissemination strategy and will inform the strategy and further design work for expanding the system to provide a 100% hydrogen scheme.

To complete question on Project Plans you must upload Table 4a (project work packages) and Table 4b (project milestone and deliverables) here. And to provide supporting evidence and illustrations upload your file/s here. Please do not upload any further text in order to go beyond the word limit, it will not be assessed. Max upload size per file - 10MB
Max number of files - 5

- File: Green Distilleries Phase2 Work Packages - Table 4a.xlsx - [Download](#)
- File: Green Distilleries Phase2 Milestones - Table 4b.xlsx - [Download](#)
- File: Green Distilleries Phase 2 Gantt Chart.pdf - [Download](#)

4c. Project Risks – Please complete a risk register (table 4c) and provide a description of the risks and risk mitigations for your Green Distilleries Phase 2 Demonstration Study. (5%) (applicants can use the upload link to provide supporting evidence and illustrations, any further text beyond the word limit will not be assessed) Applicants are expected to: Complete Table 4c (risks and risk management) outlining key project risk register for the Phase 2 Demonstration Studies, identifying key risks and providing suitable mitigation strategies. This should also include contingency planning. Download the excel spreadsheet through the link below. Once you have completed the form please save it locally. The table can then be uploaded using 'choose file' option after the question box. Table 4c - Risks and Risk Management - Phase 2 Show a realistic and robust approach to risk management. Justify and provide reasoning to the risks and mitigation actions identified (Max 1500 Words)

Managing Risk

The Risk Register (Table 4c) has been attached to this submission which captures technical, financial, commercial and project management risks associated with the implementation of the Phase 2 demonstrator project. These risks are informed by the work that was undertaken during the Phase 1 feasibility study and the Project Partners' experience of developing renewable energy and hydrogen projects. Locogen will be Project Manager for the project and will implement a robust approach to risk management as part of the ongoing management of the Phase 2 project. This approach is presented below. The main risks and proposed mitigation strategies are then outlined further below.

Locogen always aim to minimise risk as well as seeking opportunities for development across the project lifetime. Locogen readily assess risk to quality, timescales and cost of every project. By ensuring an excellent understanding of project context, including external stakeholder concerns, at the earliest stage in development and prior to any commitments to spending, we are able to highlight any perceived risks to delivery. Locogen's quality management system (QMS) ensures being up to date with changes in industry, policy standards and best practice and are able to advise whether these will impact upon project viability and the overall development of risk.

The provided Risk Register will be an ever evolving document, open to all Project Partners and BEIS, throughout the project lifetime. The Risk Register will be discussed during regular scheduled meetings to update all parties on the status and change to any risks. This allows for proactive changes to the project plan and to adapt timelines and scope as required in agreement with all participants.

In addition to the Risk Register, a Learnings Register will be continually updated as necessary with learnings as the project progresses. This will then inform interim, commissioning and monitoring reports, forming a crucial part of the project dissemination for maximising uptake and rollout of the technical solution to other distilleries and wider industry.

Health and Safety

Before attending any site, Locogen will ensure a risk assessment has been completed and checked. This will include any specific mitigation steps, PPE requirements and lone working contact systems that may be required. All of our consultants that attend site are CSCS trained to site manager level and carry up-to-date cards. Locogen have a COVID-19 specific risk assessment policy which has been enacted on numerous site visits in the last year.

Locogen are CHAS accredited (ID CHAS-128984), which is an accreditation recognised within the construction sector for health and safety. This demonstrates that the company is compliant with all the latest health and safety regulations. This knowledge will be applied in identifying any risks and in mitigation.

Where a potential health and safety risk is identified before accessing the site, Locogen will update the Risk Register and any health and safety forms. Where a health and safety risk is encountered on site, work will immediately be stopped. A formal report will then be issued as to why work was stopped with reference to the Risk Register.

Contingency

This is provided in response to question 4a.

Disaster Recovery

In addition to personnel contingency, Locogen maintain a robust disaster recovery plan to mitigate against unforeseen circumstances and ensure the continuation of projects along the agreed timelines. This has undergone a comprehensive Business Impact Analysis (BIA) and Risk Assessment to ensure that our systems have considered the key internal and external requirements and risks. This includes management strategies and contingency plans to account for the following scenarios or risks:

- IT and communications - Our document management system utilises Microsoft Sharepoint for storage and access, providing robust and secure management and storage of all data for all projects, across all consortia organisations. This ensures that we are protected against both physical (fire, theft, etc) and digital (hacking, cryptlocking, etc) interventions that could compromise project data, and a continuous backup system prevents against accidental or malicious corruption of any files stored. In the unlikely event of physical or digital compromise of our systems, we could within a short timeframe (<24hrs) set up a temporary hub with complete access to all project files and continue all project work for access by all consortium and project partners;
- Theft / Fire / Vandalism - In the event that any of these should occur, we have appropriate measures in place to protect employees, property and assets and ensure the continuity of day to day business operations. We have an intruder alarm to monitor and detect unauthorised entry and also has a surveillance system with external CCTV surveillance cameras and a fire alarm installed in the building

in the event of fire occurring. As per our IT policy, should any of our locations be compromised by physical actions, then this can be rapidly mitigated to ensure preservation of all data and continuation of work. We also have business continuity insurance cover to ensure the resources are in place to provide alternative office space in the event of a disaster at our main office; and

- Outbreak of disease or infection – This section has been part of our standard issued proposals pre-commencing the COVID-19 pandemic, however is considered even more prudent in the current social climate. Should any significant outbreak occur, either within the workplace, or within the wider community, the Framework Management Team would review the best available advice on risk factors and contagion. If the factors identify this as a sufficient risk, the Framework Management Team would implement a home-work policy. The risk factor weighting is higher for vulnerable groups, such as the following:

- o Asthma;
- o Cardiovascular disease;
- o Diabetes;
- o Autoimmune disorders and obesity;
- o COVID-19;
- o Pregnant women may have an increased risk of complication especially in the second or third trimester;
- o New mothers; and
- o Older and frail people.

Risks

Financial: The most prominent risk to the project not progressing is not acquiring the capital funding required to implement the Phase 2 demonstrator. The financial feasibility analysis conducted as part of the Phase 1 feasibility study determined that capital grant funding would be required to deliver a credible business plan. BEIS Green Distilleries Phase 2 funding is essential for realising the ambitions of Arbikie to decarbonise and for showcasing a workable technical solution to the wider industry for widespread decarbonisation of distilling and other sectors in which green hydrogen could supplant fossil fuels. The exposure and positive publicity that the project will receive as a result of being awarded the Phase 2 grant funding will also be critical for acquiring additional finance beyond the Phase 2 demonstrator as there will be a credible working technical solution that can be used to increase investor confidence, whether from private or public funding. Proving the technology works at this scale and with minimal disruption to the ongoing operation through Phase 2 will provide the confidence the wider industry needs for widescale adoption whilst minimising risk of expenditure to BEIS.

Planning & property: Planning permission will need to be granted for wind energy development. The constraints mapping exercise outlined in Appendix F of the Phase 1 feasibility report identified the lowest risk location for development and minimises the risk for objection. In addition, the scale of wind technologies proposed for development are small for a commercial development so should mitigate the risk of objection from the Ministry of Defence (MOD), whilst also presenting a reduced landscape and visual risk at planning consideration. There are a number of similar scales of wind turbine developed as farm scale developments across Angus and the use of the resulting generation for an innovative project for a local business and employer is considered to present a strong positive case for development. Arbikie own the land identified for development of the renewable technologies and connection of these technologies to the site is over land controlled by Arbikie or public highway. Therefore, the proposed project has avoided the risk of a third-party landowner refusing to provide the necessary permissions to lease or cross their land. Arbikie enjoy a strong relationship with Angus Council as an important business and employer in the region. Arbikie and Locogen have already presented the project to councillors and Angus Council have expressed great enthusiasm for the project as it aligns with their net zero strategy, other projects and ambitions to increase the take up of hydrogen as a fuel of the future. This also mitigates against the risk for securing offtaker(s) for excess hydrogen generated.

Health and safety: Hydrogen is an extremely flammable and light gas and therefore safety concerns and hazard identification formed part of the feasibility study. Identified risks through the production, storage, transport and combustion of hydrogen need to be identified and risk mitigation measures implemented. This has been accounted for in the system design. This is discussed in Section 4 and Appendix I of the Phase 1 report.

To complete question on Project Plans you must upload Table 4c (Risks and Risk Management) here. And to provide supporting evidence and illustrations upload your file/s here. Please do not upload any further text in order to go beyond the word limit, it will not be assessed. Max upload size per file - 10MB Max number of files - 5

- File: Green Distilleries Phase2 Risks - Table 4c.xlsx - [Download](#)

Collaborative Application

Is this a collaborative application? If yes you will be asked to provide contact and organisation details for each partner.

Yes

Partner 1 Contact and Organisation Details

Contact Details

Title

[This information has been redacted]

Name

Position

Email

Mobile Number

Organisation Website www.loganenergy.com

Organisation Name

Logan Energy Limited

The registered address of the Partner Organisation

Address Line 1 Lower Ground Floor

Address Line 2 One George Yard

Address Line 3 -

Town/City London

Postcode EC3V 9DF

County

London

UK Region

London

Country

United Kingdom

Organisation Type

Private Company

What is the size of the organisation?

Small Enterprise <50 employees

Number of employees (including directors)

This information has been redacted

Business Registration Number

05487219

Turnover Amount (in most recent annual accounts)

This information has been redacted

Turnover Date (in most recent annual accounts)

* 30/06/2020

Balance Sheet Total (total assets net of depreciation)

This information has been redacted

Balance Sheet Date (total assets net of depreciation)

* 30/06/2020

Is the Organisation able to recover VAT?

Yes

Organisation Maturity

>10 years

How is the organisation currently funded? (Choose all that apply)

[This information has been redacted]

Does the organisation have a parent company? (If yes you will be asked to provide details)

No

Additional Partner

Do you need to add an additional partner?

Yes

Partner 2 Contact and Organisation Details

Contact Details

Title

[This information has been redacted]

Name

Position

Email

Mobile Number

Organisation Website www.arbikie.com

Organisation Name

Arbikie Distilling Ltd

The registered address of the Partner Organisation

Address Line 1 Arbikie Farm

Address Line 2 Inverkeilor

Address Line 3 -

Town/City Arbroath

Postcode DD11 4UZ

County

Angus

UK Region

Scotland

Country

United Kingdom

Organisation Type

Private Company

What is the size of the organisation?

Micro Enterprise <10 employees

Number of employees (including directors)

1

Business Registration Number

SC464028

Turnover Amount (in most recent annual accounts)

This information is

Turnover Date (in most recent annual accounts)

* 31/08/2019

Balance Sheet Total (total assets net of depreciation)

This information is

Balance Sheet Date (total assets net of depreciation)

* 31/08/2019

Is the Organisation able to recover VAT?

Yes

Organisation Maturity

6-10 years

How is the organisation currently funded? (Choose all that apply)

[This information has been redacted]

Does the organisation have a parent company? (If yes you will be asked to provide details)

No

Additional Partner

Do you need to add an additional partner?

No

Programme Performance Indicators and Benefits

How would you describe the nature of your innovation project?

Process Development

State how many FTE jobs could be retained in your organisation as a result of participation in this project? (enter a number)

3

State how many FTE jobs could be created in your organisation as a result of participation in this project? (enter a number)

3

What is the number of Partner Organisations supported to deliver the project? (enter a number)

3

Technology Readiness Level at Project Start

	1	2	3	4	5	6	7	8	9
						X			

Expected Technology Readiness Level at Project Close

	1	2	3	4	5	6	7	8	9
									X

The Green Distilleries Competition will aim to realise the following benefits. Please select which benefits your innovation could potentially contribute to.

	Yes	No
Further understanding of technical feasibility of fuel switching/ enabling technologies	X	
Successfully demonstrate fuel switching/enabling technologies	X	
Develop industry and market awareness of fuel switching/enabling technologies	X	
Build an evidence base to improve BEIS knowledge for industrial decarbonisation	X	

Declaration Forms

Please download the following Green Distilleries Declarations Document to be signed offline and re-uploaded through the link below. If convenient you can use e-signature to sign the documents. Green Distilleries Phase 2 Declarations Max upload size per file - 5MB Max number of files - 1

- File: Green_Distilleries_Phase_2_Declarations Locogen Consulting Ltd.pdf - [Download](#)

Terms and Conditions

Please read the competition's Terms and Conditions (linked below) and select the YES button below to declare you have read them: Green Distilleries Phase 2 Terms and Conditions

	Yes
I have read the Terms and Conditions	X

Application Form Checklist

As well as the completion of this Application Form please check that, if required, you have provided the following information.

	Yes	No
Green Distilleries Project Cost Breakdown Form	X	
Partner Information Form <i>If more than three Partners</i>	X	
Project Plan	X	
Risk Register	X	
Attached supporting documentation <i>Clearly referenced</i>	X	

Signatory Page

Enter details below

Name of Organisation Locogen Consulting Ltd

Signature
Please insert name [This information has been redacted]

Position in Organisation [This information has been redacted]

Date (DD/MM/YYYY) 04/05/2021