

2.20 HYDROGEN'S ROLE IN DE-CARBONISATION

PGF Application		For: Approve	
Applicant:	First Gas Limited (First Gas)	Pipedrive ID #	Commerci e
Entity Type:	Company	PGF Funding Sought:	\$259,934
Region	Taranaki	Total Project Value:	\$ Commercial Informat
Tier:	1 - Regional	Co-contribution rate:	Comm %
Sector:	Energy	Funding Structure:	Grant

We recommend that the SROs:

- a) **Approve** funding of \$259,934 towards to the First Gas application on the basis of the wider benefits of the project including:
- The project provides an opportunity to better understand the energy infrastructure needs for a zero carbon future, which is important for the region and nationally;
 - The project will be undertaken by a consultant with requisite expertise ;
 - There is a strong level of support for the project at both regional and national levels, including Just Transitions and MBIE energy markets;
 - First Gas will co-fund and project management the work of the consultant; and
 - There is alignment with the regional strategy which involves a road map for advancement of a hydrogen based economy.
- These benefits outweigh the potential inconsistency with energy investment principles outlined below, including it being unlikely that the project will increase productivity in Taranaki within the life of the PGF.
- b) **Note** First Gas is seeking a grant of \$259,934 (Comm %) from the PGF towards a feasibility study that will look at the infrastructure requirements, and related benefits from building infrastructure, in a hydrogen based economy.
- c) **Note** it is recommended that approval of Grant funding to First Gas is made conditional on the PGF being given access to the intellectual property that is developed from the project and that it works with Hiringa Energy Limited in relation to its proposal to develop a distribution and refuelling network for hydrogen (subject to funding).
- d) **Note** First Gas, owns and operates New Zealand's natural gas transmission pipelines which run throughout the North Island. First Gas is based at Bell Block near New Plymouth, Taranaki and employs over Comm people in the local economy. As the owner of monopoly infrastructure assets, First Gas' returns are regulated by the Commerce Commission, which in turn, limits its ability to fund investments in innovation.

e) **Note** there is support for the project from both the regional and central government agencies for the project given its alignment with the need to transition to a zero carbon future. Understanding the infrastructure requirements for potential transportation of hydrogen is therefore an important consideration in understanding the future energy mix.

f) **Note** on the face of it, the First Gas application potentially does not align with the following investment principle contained in the “PGF Position Paper on Energy”, which provides inter alia:

“...the PGF will not invest in projects such as :

...

“Research and development activities for energy because there is already central government funding available for this purpose, and **projects are unlikely to increase productivity of the regions within the life of the PGF.** However, project focusing on applying and developing pilots based on recent research will be considered.”

Proposal:

Funding is for phase 1 of a larger project to develop a demonstration that (1) a regional hydrogen economy in Taranaki can extend to the rest of New Zealand, (2) the existing gas network can be re-purposed to transport hydrogen in a zero carbon future, and (3) existing jobs in the region can be maintained and new jobs created for the Taranaki region.

The project will build upon the work undertaken ^{Commercial Information} to explore the different end uses of hydrogen, including distribution and refuelling networks using hydrogen which is currently being investigated ^{Commercial Information}

Phase 1 of the project will involve:

- engaging with key stakeholders to explore the opportunities for the development of a regional hydrogen economy;
- assessing the infrastructure requirements for hydrogen production and carbon capture to storage infrastructure undertaking a socioeconomic assessment of the benefits a hydrogen economy would provide;
- calculating additional regional and national gross value add creation; and
- ascertaining the suitability of the existing gas network to transport hydrogen gas.

First Gas will engage ^{Commercial Information} to undertake the feasibility study.

Assessment against the PGF criteria:

Eligibility Criteria

No issues identified - seeking ^{Comme} % co-funding for Quasi- Commercial project.

Productivity Potential

Unlikely to be any initial productivity. The project is more focused on understanding the longer term and potential alternative uses for existing natural gas infrastructure assets and the development of new infrastructure along with associated development of skills.

Policy objectives and regional priorities

Tapuae Roa Energy Futures – road map for advancement of a hydrogen based economy
Connectivity to the New Energy Development Centre.

PGF Criteria

Assessment Commentary

Rating

		(0✓ to 5✓)
Link with fund and government outcomes		
Creates permanent jobs	<ul style="list-style-type: none"> Not applicable at the phase 1 stage of the project but essential in understanding future skills and training requirements. First Gas is headquartered in New Plymouth and with current staff of over ^{Commercial} and estimates to provide up to \$^{Commercial} for the local Taranaki economy. 	
Delivers benefit to the community	<ul style="list-style-type: none"> Longer term benefits in the sense that potential uses of existing and new infrastructure needs to be understood however no short term benefits. 	✓✓✓
Increased utilisation and returns of Maori asset base	<ul style="list-style-type: none"> N/A. 	
Enhanced sustainability of natural assets	<ul style="list-style-type: none"> Potential if existing assets can be converted. 	
Mitigation of climate change effects	<ul style="list-style-type: none"> The project relates to understanding infrastructure needs as part of the transition to low emission economy. 	✓✓
Additionality		
Adding value by building on what is already there	<ul style="list-style-type: none"> The infrastructure and skilled work force are already in place for gas transmission. 	✓✓✓
Acts as a catalyst for productivity potential in the region	<ul style="list-style-type: none"> Unclear – needs to be determined and linked in with the wider transition to hydrogen but understanding the infrastructure needs will provide increased clarity. 	✓✓
Connected to regional stakeholders and frameworks		
Alignment with regional priorities	<ul style="list-style-type: none"> Tapuae Energy Futures Plan which includes a road map for advancement of a hydrogen based economy. 	✓✓✓
Support from local governance groups (inc. Councils, Iwi/Hapu)	<ul style="list-style-type: none"> Commercial Information (aligns with Energy Futures Action Plan). 	✓✓
Governance, risk management and project execution		
Robust project management and governance systems	<ul style="list-style-type: none"> First Gas processes & systems are mature and experienced. 	✓✓✓
Risk management approach	<ul style="list-style-type: none"> First Gas processes and systems. 	✓✓✓
Future ownership / operational	<ul style="list-style-type: none"> Not considered. 	✓✓

management

Analysis of the benefits and costs

The key benefits of the project are:

- (1) understanding the energy infrastructure needs for a zero carbon future;
- (2) the strong level of support for the project at both regional and national level;
- (3) the co-funding and project management of the project by First Gas; and
- (4) the application otherwise meets the PGF funding criteria.

These potential benefits must be weighed against the approx. \$260,000 cost that the PGF has been asked to contribute to the project.

Financial Analysis

First Gas is a wholly owned subsidiary of the First State Investments which is an Australian superannuation investment fund which invests globally in infrastructure assets. Commercial Information

Funding Arrangements

First Gas will contribute ^{Comm} % (approx. \$ ^{Commercial Inf}) towards the project.

Activity	Milestone Deliverable	Commercial Information		First Gas Costs	Travel and Disbursements	Project Total	PGF Funding	Milestone Date
		GBP	NZD	NZD	NZD	NZD	NZD	
Assessment of potential end use markets for hydrogen / hydrogen blends	Preliminary Presentation	£ ^{Commercial Inf}	\$ ^{Commercial Inf}	\$ ^{Commercial Inf}	\$ ^{Commercial Inf}	\$ ^{Commercial Inf}	\$ ^{Commercial Inf}	Commercial Inf
Economic analysis of energy decarbonisation pathways	Progress Presentation and Workshop	£ ^{Commercial Inf}	\$ ^{Commercial Inf}	\$ ^{Commercial Inf}	\$ ^{Commercial Inf}	\$ ^{Commercial Info}	\$ ^{Commercial Inf}	Commercial Inform
Technical feasibility of converting the gas grid	Stakeholder Presentation	£ ^{Commercial Inf}	\$ ^{Commercial Inf}	\$ ^{Commercial Inf}	\$ ^{Commercial Inf}	\$ ^{Commercial Info}	\$ ^{Commercial Inf}	Commercial Inf
Demonstration Network Selection	Final Report	£ ^{Commercial Inf}	\$ ^{Commercial Inf}	\$ ^{Commercial Inf}	\$ ^{Commercial Inf}	\$ ^{Commercial Info}	\$ ^{Commercial Inf}	Commercial Inform
Communications materials to support next phases	Promotional Video	£ ^{Commercial Inf}	\$ ^{Commercial Inf}	\$ ^{Commercial Inf}	\$ ^{Commercial Inf}	\$ ^{Commercial Info}	\$ ^{Commercial Inf}	Commercial Inform
	Total	£ ^{Commercial Inf}	\$ ^{Commercial Inf}	\$ ^{Commercial Inf}	\$ ^{Commercial Inf}	\$ ^{Commercial Info}	\$259,934	

Due Diligence and Ownership

Commercial Information

Shareholders:

Shareholder	%
-------------	---

FIRST GAS MIDCO LIMITED

100

First Gas MidCo is owned by First Gas TopCo, which is in turn, majority owned by a Cayman Island entity 59.68 with various offshore entities (Australian and Canadian) owning majority stakes.

Directors:

- Philippa Jane DUNPHY
- Gavin William KERR (Australian Company directorship)
- Euan Richard KROGH
- Mark Adrian RATCLIFFE
- Daniel Stephen TIMMS

Trustees: N/A**Key Management Personnel:**

- Angela Ogier (Transmission Commercial Manager)
- Stephen Kirkman (Transmission Development Manager)

Risk Assessment

The following risks have been identified.

Type of risk	Risk description	Mitigations	Risk Rating L/M/H
No return on investment	Study determines that there is no potential for First Gas' assets/expertise to be used in a zero carbon economy	<ul style="list-style-type: none"> • Funding is limited to Feasibility Study which is therefore an appropriate mitigation 	Low
Further funding for next phase	The applicant has indicated that it will seek further funding from the PGF for the next phases of the project. The amounts are likely to be for significantly greater amount	<ul style="list-style-type: none"> • Needs to be considered as part of the wider energy transition strategy and related funding bodies 	Low

Consultation undertaken or implications:**NZTA**

- *New energy sources and technology will have implications for the transport sector, including the possible requirement of new network infrastructure. Proposals have the potential to contribute to reduced greenhouse gas emissions (contributing to the Government Policy Statement on Land Transport Environmental objective) but may also have additional adverse effects on the local environment, so any proposals will need to go through normal consenting processes. The Transport Agency would be interested in engaging once the proposal is further developed and the potential network impacts could be better understood, as well as how the project may align with strategy and planning work being carried out by the Agency.*
- *There are no immediate regulatory policy issues for the Transport Agency related to the proposed projects, however there will be downstream issues once hydrogen vehicles are in play. The Transport Agency is already working with MoT and MBIE to investigate the regulatory issues related to the use of hydrogen vehicles in the transport system.*

- *It is noted that the specifications of hydrogen fuelled heavy vehicles have not yet been assessed and that they may have an impact on the maintenance of the road network.*

MBIE – Energy Markets Team

Relative to the Government’s general decarbonisation policies, Taranaki transition, and Just Transition in general, the project has merit.

A lot of the information or IP that will be discovered from this project will be important to the government in evolving our renewable and zero carbon strategy. In particular in areas like, but not limited to;

- *Technical challenges and in changing the gas composition and heating value in the distribution system (high pressure – transmission and low pressure - distribution).*
- *Determination of the feasibility of repurposing the existing high pressure gas transmission system.*
- *An estimation of the size of the market size is useful.*
- *Helping to determine if hydrogen has a role in maximising the value to the Crown from existing gas fields.*
- *Determining the net benefit for New Zealand energy security over the medium term, as we transition to new energy supply models.*

Given the above it will be important that the government has fair access, without commercial prejudice to First Gas, to relevant information and output from this work.

Commercial Information

Just Transitions

I have read [MBIE’s] comments and agree with what [they] share. Free and frank opinions

[Redacted]

[Redacted]

Supporting proposal:	Yes
Appendices:	Yes – Applications and supporting letters are as annexes <i>Supporting letters withheld - Commercial Information</i>
Author of paper:	MC, Analyst, Investment Team