



SILVERMINES
HYDRO ELECTRIC POWER STATION

FOR INFORMATION

SIGA-HYDRO SUBMISSION TO IRELAND 2040 NATIONAL PLANNING FRAMEWORK

SUBJECT €650M Investment Grid-Scale Energy Storage
Silvermines Hydro Electric Power Station 360MW, Tipperary

SUMMARY

SIGA-Hydro along with our Partners are developing Silvermines Hydro Electric Power Station in Tipperary and welcome this opportunity to make a submission for inclusion in the National Planning Framework Ireland 2040.

Silvermines Hydro Electric Power Station is capable of making a significant contribution to improving Ireland's security of supply, to facilitating the development of the renewable energy sector and to reducing the cost of electricity production in Ireland.

Modelled on the ESB owned Turlough Hill (292MW), Silvermines Hydro Electric Power Station will operate by using electricity to pump water from a lower to a higher reservoir where it can be stored and then, when required, be released to generate electricity.

Silvermines Hydro Electric Power Station serves a public need with strategic national benefits of primary importance to the environment and Ireland's security of energy supply.

EU & NATIONAL ENERGY POLICY

The transition to a low carbon economy from renewable sources of energy is an integral part of Ireland's climate change strategy and sustainability objectives. There are considerable challenges inherent in realising these objectives. Grid-Scale Energy Storage, such as Silvermines Hydro Electric Power Station can mitigate some of the grid-connection challenges posed by intermittent power plants, such as renewable electricity plants powered by wind, solar or tidal power, and can help to better manage the electricity system.

Silvermines Hydro Electric Power Station can deliver specific energy policy objectives set out in EU Legislation, National Energy Policy and Local Development and Planning Policy.

BENEFITS

- Strategic infrastructure grid asset, it strengthens the stability of the national electricity grid
- Underpins the economic and financial viability of wind power and other renewable sources of electricity generation
- Self-financing project, leveraging €650 million investment in a labour intensive capital project (€2.5bn over project life)
- Competitiveness, proven ability to reduce the wholesale costs of electricity production in Ireland
- Enabling technology for Ireland's low carbon economy and attracting new inward investment (e.g. Green PPAs for new FDI)
- Remediation of a contaminated brownfield and derelict site (environmental enhancements to include improved water quality, soils, waste material, visual landscape, public safety)

DESCRIPTION

Silvermines Hydro Electric Power Station represents a strategic investment of national importance with proven and defined public interest benefits. The total project investment is €650 million and subject to planning, construction is planned to commence in 2019 with commercial operations scheduled in 2022/2023. More than 70% of the construction cost is civil engineering, which will be spent locally in Ireland.

It will stimulate job creation and expenditure at local, regional and national levels. The capital expenditure is front-loaded with a high-Irish content occurring within the first four years of project. The Project can be privately financed and delivered on time. Over the life of the Project the benefits flowing into the national economy will exceed €2.5bn.

The project will reduce wind curtailment and reduce the investment required in renewable energy capacity to meet National energy targets. Silvermines Hydro Electric Power Station will reduce the cost of electricity at wholesale level and also the retail price of electricity by reducing the Public Service Obligation levy (by increasing the price of electricity at times of high wind generation), thus increasing Ireland's competitiveness.

SIGA-Hydro commissioned the Project Feasibility Report in 2012, which confirmed that Silvermines Hydro Electric Power Station can be permitted, constructed and

connected to the system with a high degree of certainty with regard to cost and schedule.

Regulatory uncertainties since 2012 delayed the Project start; however recent decisions (e.g. ISEM 14-108) by the Regulatory Authorities (RAs) provide the revenue visibility to support further investment in the Project.

The design and planning preparation for Silvermines Hydro Electric Power Station has commenced and it is intended to submit the planning application directly to An Bord Pleanála in accordance with Part VIII, Strategic Infrastructure Development (SID) of the Planning Act 2000.

The planned investment is located at Silvermines in Tipperary and will rehabilitate a brownfield mining site, which has remained abandoned and derelict for the past 20 years. It is a clean project in the renewable energy sector and can deliver significant planning gain.

Project Information Notes

Silvermines Hydro Electric Power Station has multiple modes of operation, which means it can serve as a generation asset by providing capacity and injecting energy (when generating), a load asset by contributing to demand and withdrawing energy (when pumping), and a grid asset by providing system support services required by the TSO (Eirgrid).

The planned capacity is 360MW and it will provide daily storage capacity of 1.8GWh. Operating in full generation mode the plant has the ability to generate renewable electricity in excess of 650GWh per annum, equivalent to the amount of electricity consumed annually by 200,000+ homes

Silvermines Hydro Electric Power Station (No. 3*120MW) will operate a closed fresh water cycle and is strategically located at the intersection of the 220kV and 400kV transmission lines, a grid strong point. This location eliminates the need for extensive new network build while simultaneously offering improved network resilience and grid reinforcement opportunities.

A brownfield site comprising of 365 acres has been acquired by SIGA-Hydro to accommodate the Project. The site was formerly used for open-pit mining and has remained derelict since mining operations ceased in the early 1990's. It is planned to re-use and rehabilitate the derelict site to facilitate the construction of Silvermines Hydro Electric Power Station, a clean and renewable energy infrastructure asset. The completed project will have a positive environmental impact and offers significant gains to the local community.

The nature and geographic location of Silvermines Hydro Electric Power Station will offer many benefits to system security and will provide greater network resilience. This will assist in relieving existing congestion and improve network stability, which has potential to either reduce or defer the capital investment required by the TSO for deep reinforcement of the grid.

It is widely acknowledged and proven that the multi-modal capability of pumped storage facilitates the operation of a more secure, reliable and efficient electricity system. In Ireland, the forced outage of Turlough Hill since July 2010 has particularly emphasized the importance, reliance and benefits of pumped storage in terms of grid stabilization and lower electricity production costs.

In electricity markets across the world, Grid-Scale Energy Storage such as such pumped storage continue to be developed for reasons of strategic and national importance. Throughout the EU, pumped storage has been identified as the preferred and necessary ‘enabling’ technology to efficiently integrate renewable generation.

The renewable electricity target in Ireland is significantly greater relative to any other region in the EU. The volatility and intermittent nature of wind generation exacerbates the difficulties in balancing electricity supply and demand. Furthermore, this unpredictability threatens the stability of the entire electrical system, which can result in reduced power quality, supply outages and major blackouts with potentially detrimental economic consequences.

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About Project Developers

SIGA-Hydro is an infrastructure development company established in 2008 by Darren Quinn, CEO. SIGA-Hydro is focused on strategic asset development in the clean energy sector, specifically developing enabling technologies such grid –scale energy storage. The company and management team have extensive, successful experience permitting, designing, constructing and operating safe and innovative energy technologies and infrastructure investments. SIGA-Hydro shareholders include Irish construction companies John Sisk & Sons and Roadbridge.