

## KEYWORDS

- Power Station
- Engineer
- Hydroelectric Scheme
- Turbine
- Electromagnetic
- Energy
- Electricity
- Sluice gates
- Penstock
- Efficiency
- Megawatts
- Watt
- Tonnes per second
- Dam
- Power

## ENGINEERING SHANNON SCHEME:



Ardnacrusha was vitally important to the Free States image of itself, however first and foremost it was an engineering project - a series of challenges that had to be solved one step at a time. It wasn't just any old engineering project. It was the biggest hydroelectric scheme ever undertaken in the history of engineering.

It was a courageous gamble for the new Free State to devote twenty percent of the countries budget to a single high technology engineering project. Seaman Shuman, a German company, was contracted to do the job in 1925 and 150 of staff supervised Irish workers. Engaging in overseas company had sufficient symbolic value. The Irish Free State was emerging from the shadows of the British Empire and reaching out to the wider world.

The stakes couldn't have been higher. They would have to build a massive dam wall with sluice gates to hold back the 30 metre high wall of water. The water would then have to fall towards a massive coiled tube which would spin the turbine shaft generating electromagnetic energy and creating electricity.

Water passes through these huge steel tubes called penstocks. Now, when I say passes through, it's a bit more impressive than that! Water is thundering through each penstock at 100 tonnes every second. The penstocks are 41 metres long and 6 m in diameter, big enough to drive a double decker bus through. Although the complex equipment has been refurbished several times. Ardnacrusha has changed very little since it was opened.

Alan Bane is the Power Station manager. Alan, where are we now?

At the moment, we are in the generator hall in Ardnacrusha...what we have here is three units. See here....1,2 and 3 – which were installed in 1929. They are all Francis units. Behind me here, we have unit 4 which was installed in 1934, that is a different type of unit – a Kaplan unit. The difference between the two is the Francis unit has a fixed blade whereas the Kaplan is more like a ship's propeller. It has variable blades for greater efficiency.

So it will produce more power? Unit 4 is designed for 24 megawatts whereas the other units are slightly less.

What can you get out of this unit?

Overall it is 86 megawatts at full output.

So in its hey-day, it could do 86 megawatts.

Yes and it still can.

The dam turbines and generators provided the solution for harnessing the power of the water. As soon as it started to produce electricity in 1929, those 86 megawatts of power provided the electricity needs of the entire country.