

Sustainability

Iplex **Apollo™** PVC-O, is a sustainable infrastructure pressure pipeline asset.

It has **low Embodied Energy**, can utilise **re-processable PVC** from its manufacture, and **is fully recyclable** at the end of its service life.

Apollo's **light weight** requires relatively **less non-renewable energy** (eg ; diesel) during transportation. Light weight also means significantly **more length of pipes per tonne of raw material** can be produced, compared with almost any other pressure pipe of similar diameter and pressure class

Apollo has **no additives containing toxic heavy metal compounds**, such as lead based materials. This actively **prevents more of these compounds entering the environment**, and positively **reduces industry demand for these compounds**, upstream

of the manufacturing process.

Apollo manufacture produces **less greenhouse gases**, than for traditional non-plastic pressure pipe manufacture. Recycled cooling water resources are used during production.

Apollo is **chemically inert**. There is **no corrosion or chemical or gas emissions** during its normal long service life as a public watermain or sewer.

Apollo is also **extremely durable**, meaning that the **one-off energy consumption** in manufacture to create the pipe asset, is only required to be used once, possibly up to every 100 years if installed and operated according to the relevant codes and standards.

Refer also to the PIPA website
www.pipa.com.au/environment



Embodied Energy

Embodied Energy

Construction industries are starting to embrace concepts of Life Cycle Analysis (LCA) and Whole of life Costing (WOLC). **Embodied Energy Analysis (EEA) is a method of comparison of the total energy used to manufacture and install different materials.**

The manufacture of various pipes utilises different processes and materials, with differing energy requirements. Identifying how much total energy is needed, should account for the direct energy needs of the actual manufacturing process, as well as the

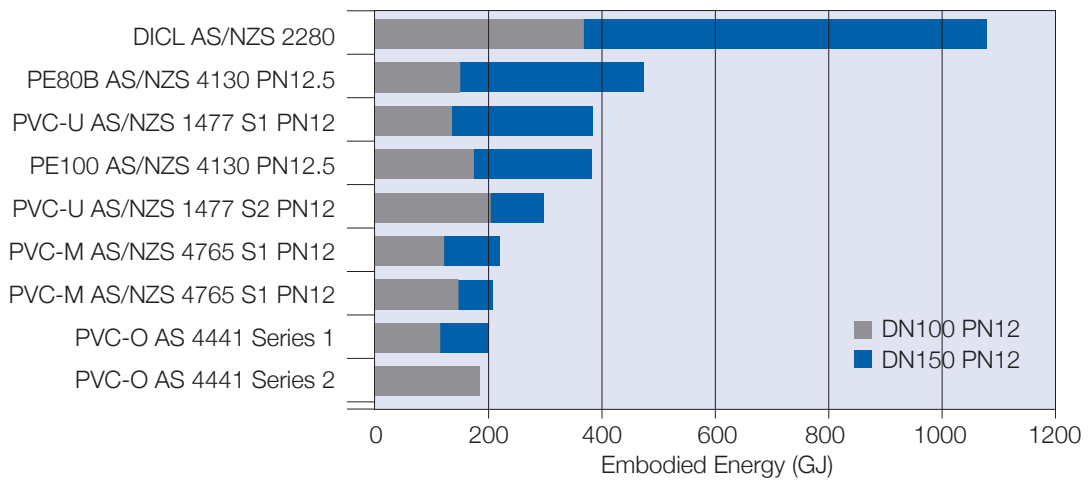
indirect energy that comes from all the associated processes that contribute to creating a pipe.

This energy is called Embodied Energy, and can be used to determine the overall energy impact of a particular piping system.

The recent published study by CSIRO in Australia “Piping Systems Embodied Energy Analysis” has demonstrated the significant reduction in embodied energy for PVC-O pipes compared to other pipe materials, based upon the same hydraulic performance conditions.

Example of Embodied Energy Comparison

Chart based on Scenario 1 Figure 1 for PVC-O pipe, refer www.pipa.com.au/environment (Embodied energy)



Note: This graph is sourced from the Plastics Pipeline Industry website shown above. It arises from a report carried out for a manufacturer of PVC-O pipe and is not a report of tests conducted on Iplex Apollo™. It is included to illustrate the possible capability of PVC-O product generically. As this test was not conducted by or for Iplex Pipelines, Iplex accepts no responsibility for its accuracy.



Renewable Energy and Recycling

Renewable Energy

The manufacturing process for **Apollo™** pipe in New Zealand, uses electrical energy, which includes that generated from sustainable or renewable resources including major wind farms located near Iplex's production site in Palmerston North, as well as geothermal and hydro-electric sources.



Recycling

Iplex Apollo can utilise re-processable PVC material from the PVC-O process, as permitted by the manufacturing Standard.

Processes and methods exist in New Zealand for collection and recycling of PVC pipe offcuts from the market place. Iplex Apollo PVC-O material is 100% recyclable at the end of its long service life.

