

Innovation and Implementation in Engineering

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Innovation experience

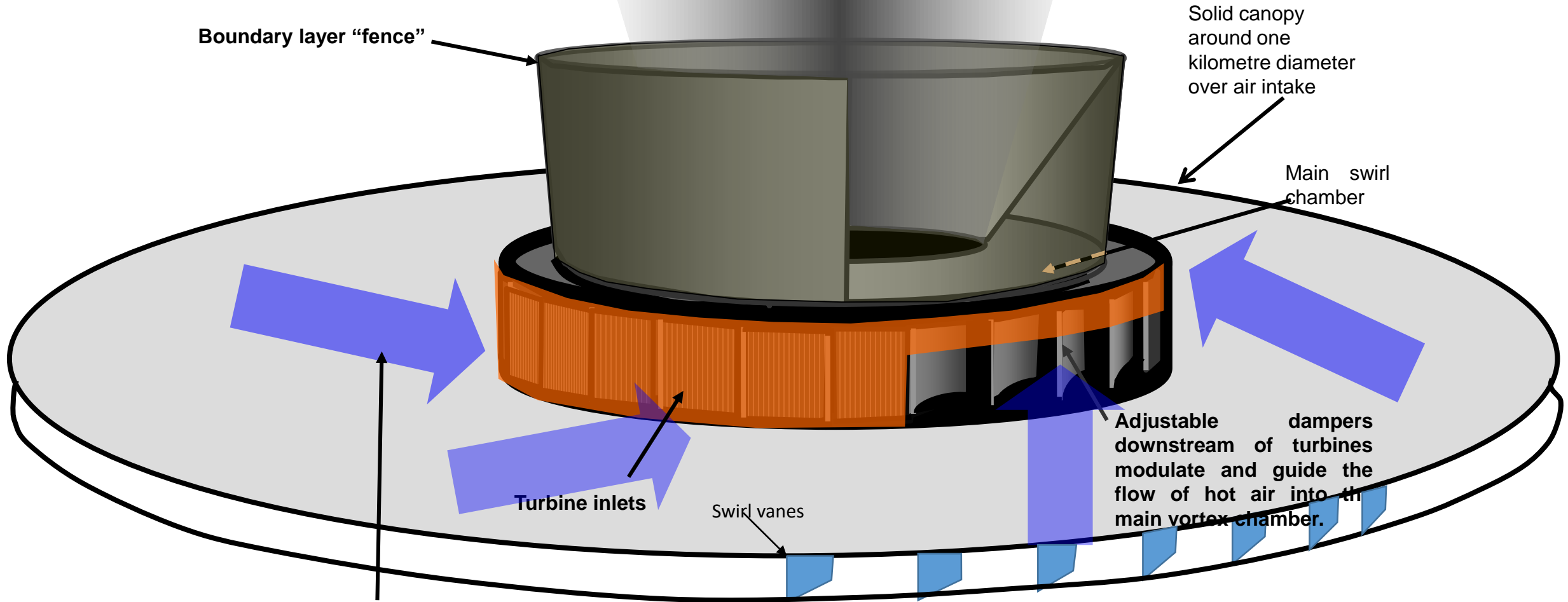
- Employment with **Orbital Engine Company** as a mechanical engineer in internal combustion engine research (1974 – 1977)
This included
 - Engine sealing system development
 - Engine cooling system development
 - Engine combustion chamber fluid dynamics computer modelling
- Investigation of gyroscopic dynamics within the engineering laboratories of **Challenger College of TAFE** as part of Master of Engineering Studies programme at the **University of Western Australia** (1994 – 1996)
 - Creation of a computer model for simulation of gyroscopic dynamics from first principles
 - Research into gyroscopic dynamics to confirm physical model
 - Theoretical study of the potential of the use of the principles in a regenerative braking mechanism/variable speed transmission
- Invention of a device to generate hypersonic shock waves for ultra-high temperature research (**The Liquid Pendulum Engine**). A provisional patent application was lodged by my employer **Challenger College of TAFE** (1997)
- Invention of a version of the **Vortex Engine** utilising low grade geothermal energy **Vortexengineer** (2006)

Innovative Quality

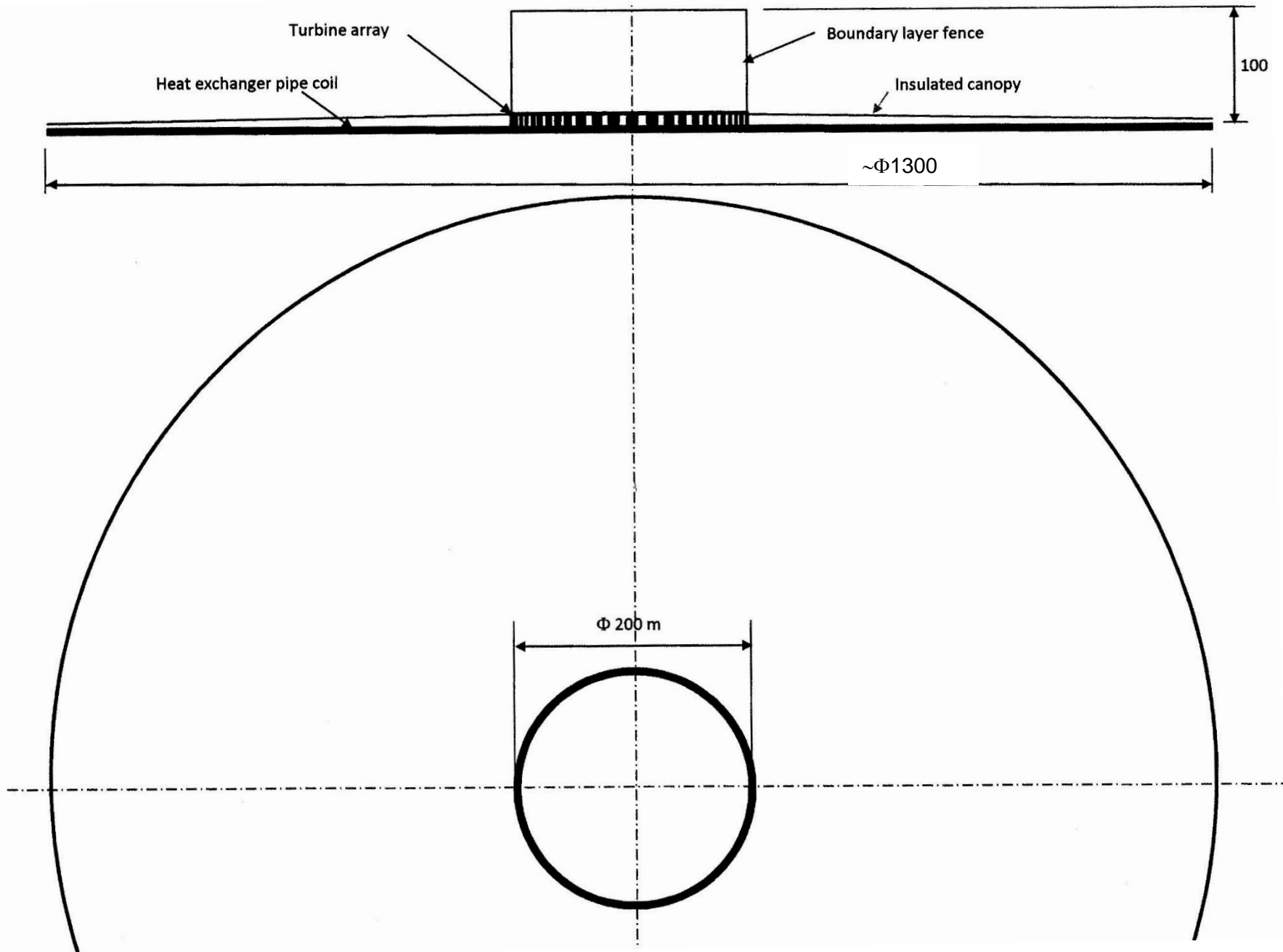
- I have always been innovative within my work where possible and practicable.
- The University of Western Australia accorded me the highest honour amongst graduating Masters candidates, partly in recognition of the quality of my dissertation on gyroscopic dynamics.
- The website containing my technical PowerPoint presentations on the **vortex engine** and the **liquid pendulum engine** has been accessed by:
 - 33 governments or government organisations
 - 82 academic organisations
 - 97 industrial/commercial corporations

The Vortex Engine

The Vortex Engine



Air picks up heat from pipes beneath a canopy creating a water-to-air heat exchanger, before entering the vortex engine main swirl chamber



The Vortex Engine

The claims made with regard to the vortex engine are:

1. It will help to lower global atmospheric temperatures by
 - i. Enhancing the efficiency of convection within the troposphere
 - ii. Increasing precipitation, hence reducing water vapour (the most important greenhouse gas) in the atmosphere

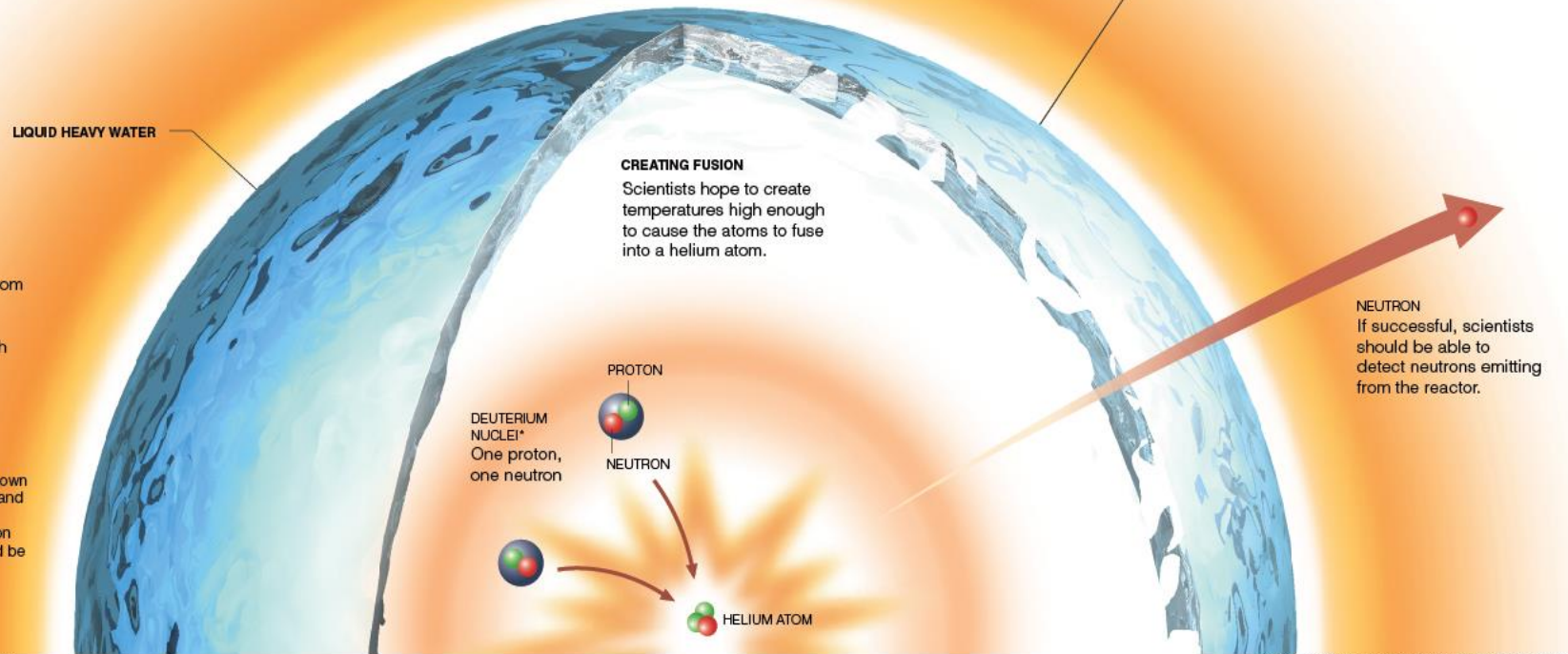
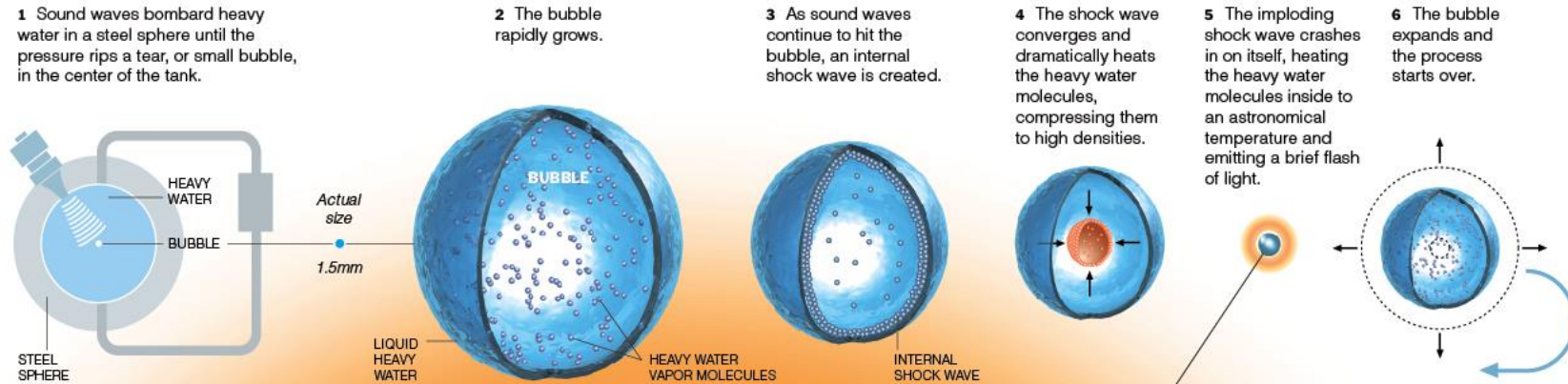
2. The engine will be able to enhance the three important issues of:
 - i. Power generation
 - ii. Water supply
 - iii. Food supply.

The Liquid Pendulum Engine

Sonofusion

Sound And Fury

Scientists are pursuing a mysterious phenomenon called sonoluminescence, that may be capable of raising the temperature of gas trapped in a tiny bubble to 10 million degrees Celsius — enough, in principle, to ignite fusion. At right, one design to use sound waves to create and collapse tiny bubbles.



Light that escapes from the bubble includes ultraviolet radiation produced only at high temperatures.

*Once this method is shown to work, one deuterium and one tritium, a version of hydrogen with one proton and two neutrons, would be used in fusion.

“...Prospects for initiation of thermonuclear fusion reactions within a sonoluminescing bubble were suggested when theoretical simulations of the SBSL phenomenon by Wu and Roberts showed the existence of maximum bubble temperatures of the order of 10^8 K! These extreme temperatures were limited to a small region of the bubble interior and were made possible by the launch of a shock wave within the already compressed gas. The shock focuses as it approaches the bubble centre and doubles its strength when reflected from the origin.”

“In an another study, Moss *et al.* showed that hydrodynamic simulations of a collapsing bubble containing D₂ and D₂O vapour provide the possibility for a small number of thermonuclear D–D fusion reactions in the bubble...”

Sonoluminescence and bubble fusion
Vijay H. Arakeri

The Liquid Pendulum Engine:

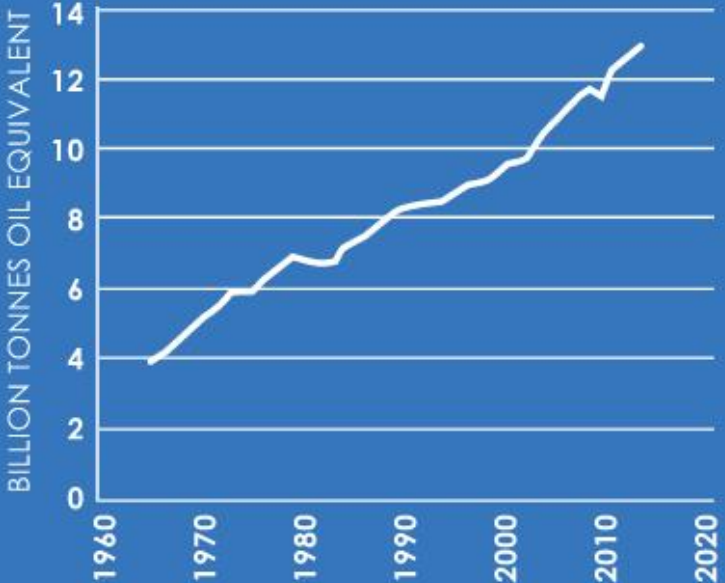


Global energy demand continues to increase.

50%
INCREASE BY
2030

THE NEED FOR A **NEW** **ENERGY** **SOURCE**

WORLD ENERGY CONSUMPTION
(BP statistical review of world energy 2014)



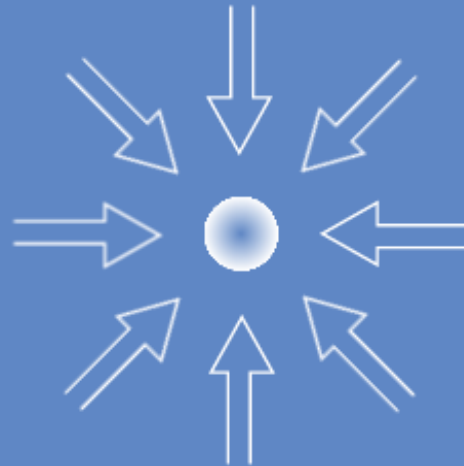
The Liquid Pendulum Engine:

MOST ATTEMPTS TO DO THIS HAVE TRIED TO ACHIEVE A PERFECT **SYMMETRICAL** IMPLOSION

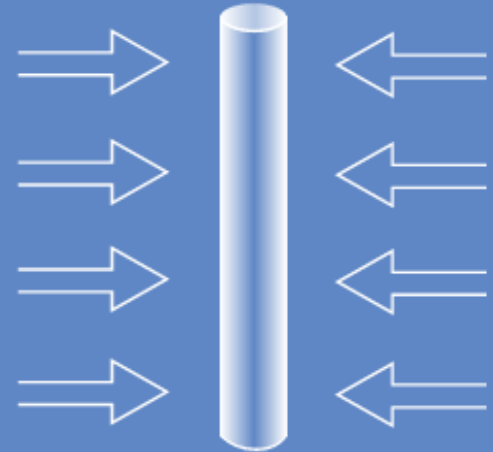
As this gives efficient **compression**

SIMPLE DIAGRAMS OF INERTIAL CONFINEMENT FUSION

SPHERICAL IMPLOSION

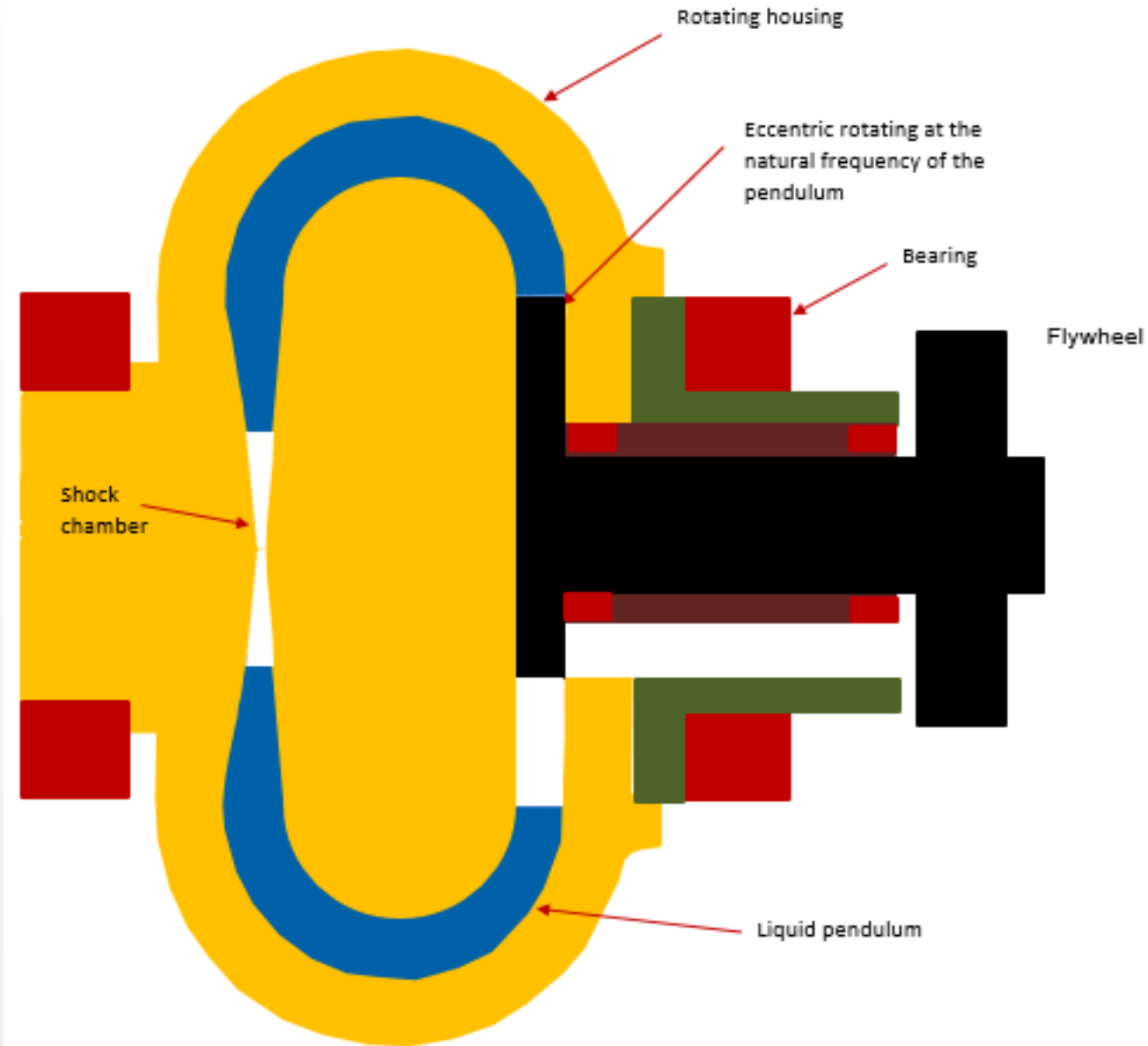


CYLINDRICAL IMPLOSION



First Light Fusion Ltd.

The Liquid Pendulum Engine



Advantages of the Liquid Pendulum Engine

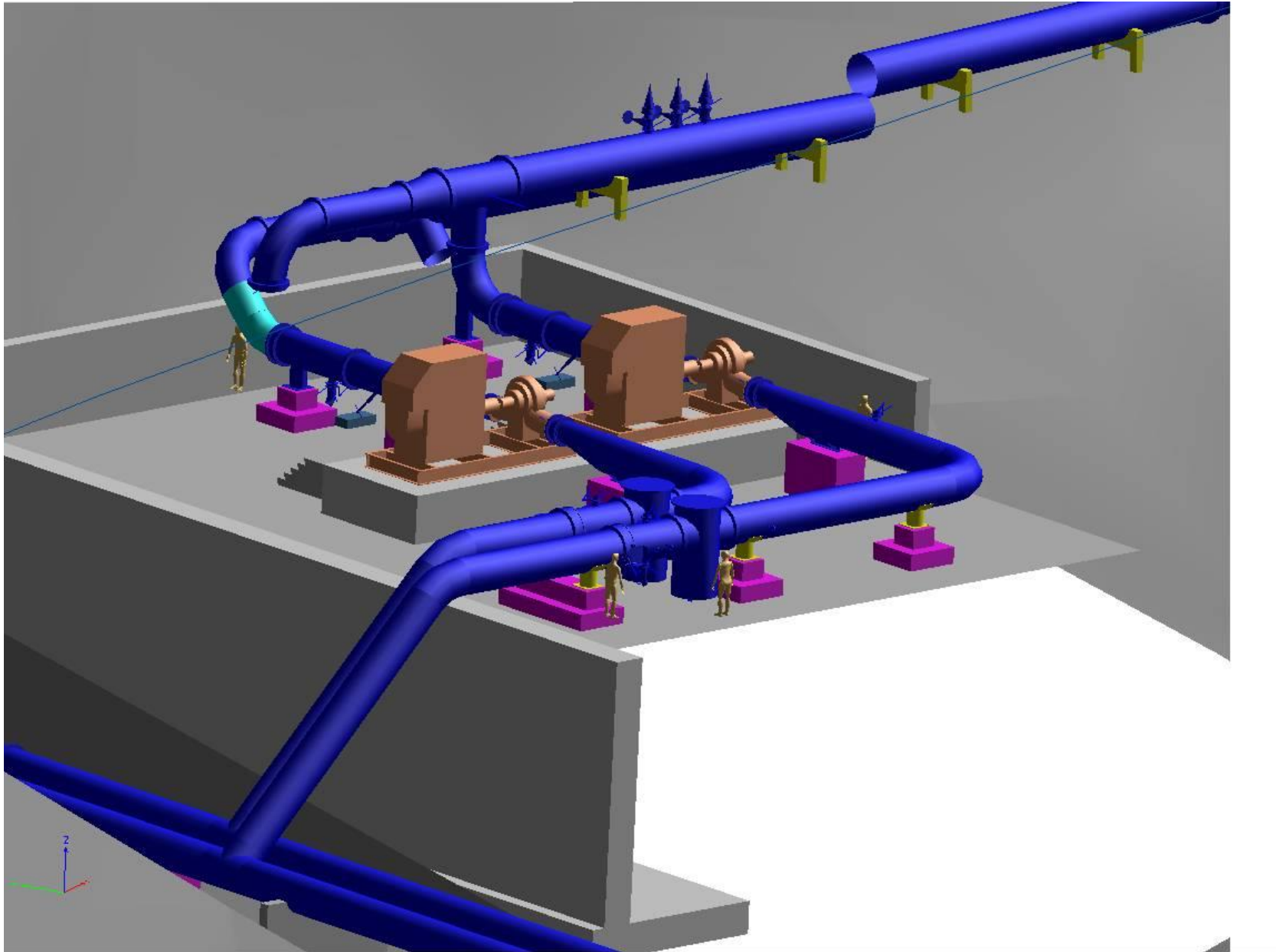
In the Liquid Pendulum Engine, the natural frequency of the oscillation of the system is proportional to the rotational velocity. The piston is able to cycle at several hundred times per second. This is at least two orders of magnitude greater than that for the General Fusion concept and hence the number of fusion reactions required per cycle is reduced accordingly. Furthermore some of the energy may be delivered directly through the eccentric shaft rather than having to go through a Rankine cycle steam plant.

The Vortex Engine and the Liquid Pendulum Engine are arguably the ultimate sustainable energy sources, each having its own advantages.

See <http://www.vortexengineer.com/liquid-pendulum-engine.html>

Other (Conventional) Design Projects:

Raw Water Pumping Station (2 x 1500 kW) Zambia Africa



“Snapshot” of 3D design model during design process

Raw Water Pipeline 17.6 km long 1.2 m diameter

