The Story of Maui

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The Sustainable Energy Forum Inc have published a major article on the early depletion of the Maui gasfield, in their journal EnergyWatch. Forum Convenor John Blakeley said today, "Maui gas is running out even faster than predicted, and an early end to the contract is almost inevitable." Mr Blakeley said that the percentage change in the estimates of total Maui gas reserves originally in the gasfield was not particularly large, but was serious for New Zealand because it was so late in the life of the field, and because current production rates are so high. Published estimates of total economically recoverable gas for the Maui field have fallen from 4130 PJ (petajoules) on 1 January 2001 (102% of the contract quantity) to 3562 PJ on 1 January 2003 (88% of the contract quantity).

"In 2001 and 2002 we burnt a total of 390 PJ of gas and 'lost' another 564 PJ in the redetermination process, leaving only 370 PJ available at the beginning of this year," Mr Blakeley said. The 'lost' gas has a contract value of some $ 1.0 billion. Mr Blakeley added, "If these production rates have continued in 2003, we will have already drawn off another 50 PJ so far this year."

EnergyWatch editor Kerry Wood said that the rate of gas production was now about twice as high as originally foreseen for this level of remaining gas reserves. "It is possible for high production rates to limit the amount of gas that can be produced from a field," he said, "and this might have contributed to the recent fall in recoverable gas quantities." Mr Wood said that it would now be difficult to make the field last beyond the end of 2006. "Even getting another four years of Maui gas will need production rates less than half of 2001-02 rates, but it is impossible for outsiders to the Maui contracts see how this might be arranged." Mr Wood added, "Maui gas can now do little or nothing to maintain electricity supplies in a dry year."

Energy Analyst Steve Goldthorpe draws attention to data in Energy Data File showing a steep rise in the overall Maui liquids to gas ratio, starting in 1994 and peaking in 1997 before declining rapidly. Liquid yields make gas production economic. "We need to find out the real story of Maui, and what lessons can be learned for New Zealand," he said. "The one thing that is certain is that we don't have the whole picture."

Mr Blakeley said, "I believe that the premature decline of the Maui gas field is a firm wake-up call to the whole of the New Zealand energy sector. We need to urgently work together and consult widely to achieve an overall energy vision which has the widest possible buy-in." He added, "New Zealand must urgently move away from meeting growing electricity demand with more thermal power stations, and towards renewable electricity supply, including wind, geothermal, hydro and forestry biomass. Renewables on the supply side, and energy efficiency and demand management on the demand site, are now the safest approaches."

The full EnergyWatch article also contains diagrams showing how the field has been depleted. Points made in the full article include:

- A petajoule is a unit of energy, a thousand million million Joules, equivalent to about 28 million litres of petrol, or about 1% of annual petrol use in NZ.

- Published total (original) gas reserve estimates for the Maui field have fallen from 4238 PJ on 1 January 2000 (104% of the contract quantity), to 4130 PJ on 1 January 2001 (102% of the contract quantity) and 3562 PJ on 1 January 2003 (88% of the contract quantity).

- In two years, gas with a contract price of some $ 1.0 billion has somehow been “lost”, This might be because it was never producible (or never there) in the first place, or it might be because the reservoir has been “damaged”, by extracting gas too quickly.

- Gas production in 2001-2002 has been about 195 PJ/yr, the highest in the life of the field and at a time when the original contract provided for falling production rates. If this rate has been continued this year, it is now roughly double what was originally proposed for the current level of remaining gas reserves.

- If the 2001-2002 production rate is continued, gas will nominally run out in late 2004. This is unlikely in practice, because production problems or further loss of gas will force a lower production rate.

- If production is now rapidly reduced to the rates originally foreseen for the current level of remaining gas reserves, utilisation of the remaining 370 PJ of gas, as determined by the Independent Expert, might be roughly:

  2003 115 PJ 2004 95 PJ 2005 85 PJ 2006 75 PJ 2007 (Field closed)

- The Maui contract has provision for gas reserves to be redetermined every two years. However, redeterminations were not called for by the parties to the contract and ˜ at least publicly ˜ none were done until 2001.

- The recent redetermination by the Independent Expert is not particularly large and would not be a problem if it had been made earlier: there would have

been time to develop other options. The problem is the combination of a very late first redetermination, high production rates late in the life of the field, and high dependence on a declining resource.

- Possibly the biggest single factor is that in the 1990s the Government took its eye off the ball. In 1991 it on-sold its rights to pre-paid gas at a heavily discounted price to three users. Since then, each user has been trying to use or sell this pre-paid gas as fast as possible, to maximise their own share before the field runs out.

- Government action may now be impractical, because any attempt to influence the outcome (for example by reserving gas for electricity generation) would be bogged down in the courts until all the gas was gone. We have already seen signs of this, with Methanex delaying redetermination by the Independent Expert.

Measures now needed include:

- Arrange for alternative fuels to be used at Huntly (coal) and New Plymouth (oil) power stations, and increase production from existing smaller gas sources. Action is already being taken here.

- Open the electricity market to demand-side participation.

- Look for energy efficiency measures and consumer energy alternatives, and encourage consumer behaviour to reduce demand.

- Develop sustainable energy sources as rapidly as possible.