

THE RATIONAL PATH TO THE AGE OF RENEWABLE ENERGY

RICHARD J HUNWICK
Hunwick Consultants Pty Ltd

ABSTRACT

Electricity consumption could well increase six-fold over the course of this century, as all the world's people strive for first-world living standards.

Even if this foreshadows electricity replacing oil and gas in transport and other markets, the outlook for greenhouse gas emissions is ominous indeed, unless this electricity can be derived from primary energy sources without consequential greenhouse gas emissions.

Society would prefer that primary sources used be renewable. Is this possible, and if so, what has to be done to bring this utopian vision about?

This paper attempts to forecast the extent of the world's reliance on its available energy sources: fossil, nuclear and renewable, through the span of this century. A model based upon the Experience Effect is applied to forecast how the relative shares enjoyed by these sources might shift in light of current constraints and what, if anything, needs to be done to ensure the world frees itself of concerns over global warming.

INTRODUCTION

The world seems set to fulfil the worst fears of the Intergovernmental Panel on Climate Change (IPCC): that greenhouse gas emissions could double over the course of the century if no actions (of the sort they advocate) are taken.

A century is a long time, most of us have difficulty looking a year ahead, and "long-range forecasts" usually mean a decade hence. That said, so long as care is applied regarding what is being forecast, there are tools we can apply that allow defensible long-range forecasts to be made in areas relevant to the formulation of energy policies.

If we apply these tools what do we find? Will the world still be getting most of its energy from fossil fuels, or will the shift to the Age of Renewables be well underway if not essentially complete? In turn, should we be worried about greenhouse impacts, or find something else to worry about? What should we be doing to ensure that we leave the world to our descendants in better condition than it is on our watch?

The International Energy Agency (IEA) estimates that greenhouse gas emissions from energy production, transmission and end-use represent around 70 per cent of all such emissions, which are currently estimated at 24 billion tonnes of carbon dioxide equivalent annually. This is to say, the greenhouse problem is largely an energy problem.

The rise and rise of energy demand

We had better hope that things don't continue as they are. Consider the longer-term consequences of current trends in transport and electricity demand:

Please request the full paper from richard@hunwickconsultants.com.au