

Appendix 20: The Energy Equivalence Principle in Fossil Fuel Depletion

Our current business concept (1) is to deplete a resource and make \$ profits from the sale of the resource. This is not sustainable as we are running down our resource asset account and the profits are consumed. We must invest part of our profits in renewable energy capacities which replace the depleted resource on an annual basis (2).

Profit calculations have to be done in both \$ AND physical energy accounts. In fact, energy accounts are more important. If the balance is not positive on the energy account, the process of making \$ profits will come to an end sooner or later. If we do not introduce an energy replacement system as described below under (2), our economy one day will be thrown back to the slow process of solar breeding.

Example: Gas export of 5000 PJ over 20 years (250 PJ pa)

(1) Current profit making

Physical Energy Account in Peta Joule pa	
IN produced	OUT exported
250	250
Result after 20 years: gas resource depleted at end of production period; production of energy comes to an end	

\$ Transaction Account		Remarks
IN gas sales	OUT	
\$.....	\$...cost...	gas exploration and production cost
	\$...company profit...	used, re-invested, spent for what?
	\$...dividend shareholder	private consumption
	\$...tax income for Government	including secondary and tertiary effects; used in budget
Result after 20 years: income from gas export is spent; income stream ends		

(2) Future energy productivity

Part of profits, dividends and tax income to be spent on renewable energy projects

Investments in Renewable Energy Production			
	Physical Energy Account in Peta Joule		Renewable capacity PJ pa
	IN produced	OUT available	
Year 1	12.5	for	12.5
Year 2	25.0	consumption	25.0
Year 3	37.5	without	37.5
etc		depletion	
20 years	2500	2500	250

Results after 20 years:
 (1) payback of 50% of gas energy;
 (2) annual renewable capacity equivalent to the energy content of annual gas exports

Note: renewable capacities have to be slightly higher to provide for energy needed to replace aging renewable power plants

