Recycled Energy as a Renewable Resource

Virtually all involved in the energy and power sectors understand the need to promote renewable resources. They can reduce the consumption of fossil fuels in the utility power stations, thereby improving energy security and (with most sources) the environment simultaneously. To this end, it is in our best interest to encourage the use of renewable resources by providing some incentives to accelerate their market acceptance.

Simply put, for every kilowatt-hour of generation from a wind farm, solar or geothermal plant, there is a one-for-one reduction in the kilowatts needed from a utility plant burning fossil fuel.

But what about when fossil fuels are used in an industrial plant or gas pipeline compressor station? The manufacturing of steel, glass, cement and petro-chemicals, and the transmission of oil and natural gas to their respective markets can only be achieved by consuming fossil fuels. Neither solar nor wind nor geothermal can refine a barrel of oil or produce a ton of glass.

Given industry's indisputable need to rely solely on fossil fuel for many products and processes, the logic used to disqualify surplus heat or recycled energy as a renewable resource does not pass muster. To argue that industrial recycled energy should not be treated as renewable merely because industrial processes use fossil fuels is to imply that the successful development and widespread use of solar, wind, etc. will one day reduce the amount of fossil fuel consumed in our industrial plants. This, of course, is totally false. The logic of promoting fossil fuel substitution and alternatives to utility power generation does not apply to industrial process and manufacturing plants.

It follows from this argument that the type of fuel consumed in an industrial plant should have no bearing on the classification of its surplus heat. The surplus heat is constant, i.e., renewable, as long as industrial products continue to be made. Consider the following example.

The manufacturing of clinker, the main ingredient of cement, is very energy intensive. A very large quantity of heat is required to decompose the feedstock (limestone) into clinker. Those plants that use to burn natural gas have switched to some type of low grade fuel, such as coal, shredded tires, biomass, etc. because natural gas has become too expensive and the process and product are compatible with the use of solid fuels.

A plant that produces one million tons per year of clinker while burning shredded tires (classification as a renewable) generates the same amount of surplus heat as a plant that burns coal. Does that mean that the surplus heat from one plant should be classified as a renewable but not in the other? Yet this how current statutes read.

Recycled Energy/Waste Heat vs. Renewable Resources

Another argument in favor of equal treatment for recycled energy can be seen in the comparison of recycled energy to other renewable resources.

Resource	Reduced Fossil Fuel	Emissions-Free	Base Load	Inside the Fence	Gen Cost $/kWh
Solar PV	Yes	Yes	No	Yes	.20
Wind	Yes	Yes	No	No	.04-.05
Biomass	Yes	No	Yes	Yes	.06-.12
Geothermal	Yes	Yes	Yes	No	.05-.07
Recycled Energy	Yes	Yes	Yes	Yes	.03-.04

In every category, including generation cost, recycled energy performs equal to or better than every renewable resource shown. If the use of recycled energy surplus heat is as beneficial as suggested in the table above, then one would ask the question "why hasn't it been applied on a broad scale"? Casten (1) cites a few reasons.

- Regulated local utilities have little incentive to build recycled energy projects. Fuel savings would simply lower electricity prices while utility management would have to deal with many small projects.

- Independent power developers, whose core competency is energy, face high standby and interconnection chargers for small recycled energy projects, and then receive discounted prices for their power because the below-50MW blocks do not fit the current power market, and

- Regulated local utilities, to avoid losing sales and profits, use many techniques to block all decentralized generation.

1. Casten, C.R. and Collins, M.J; Recycled Energy: An Untapped Resource; Private Power, LLC publication, April, 2002.

Then there is also the issue of sharing the pie with others. Those whose products and technologies are already incorporated into the RPS, and who enjoy various forms of production tax credits and other subsidies, are reluctant to invite the recycled energy stakeholders for a fear of losing a portion of their tax benefits. The recycled energy industry has nothing to compare with the Solar, Wind and Biomass lobbies.

Impact of Using Recycled Energy

In the US National Combined Heat and Power (CHP) Program of 2001, the stated goal was to double the amount of CHP by 2010. The roadmap estimated that by accomplishing this target the US could annually achieve:

- 46 GB of new, clean electric capacity
- 1.3 trillion Btu's per year in reduced energy consumption
- 0.4 million tons of reduced NOx emissions

- 0.9 million tons of reduced SO2 emissions

The 46 GW of new, fuel-free capacity is equivalent to ninety-two, 500MW gas-fired combined cycle plants. According to the US EIA this represents about 4.5% of the total installed capacity of all US generation in 2004 (1,049GW) and more than twice the capacity (21.1 GW) of all renewable capacity combined.

Converting recycled energy/surplus heat into power is achievable using technologies available today. Not only would we be able to postpone the construction of 92 utility plants and displace all the greenhouse gas emissions from these plants, we would also be able to produce power at a lower all-in cost than that of any fossil fuel utility pant. The barriers that pace the commercial implementation of recycled energy projects are not technical. They are institutional and political.

We ask your help in bringing this relatively unknown, underutilized energy source into the prominent light it deserves as one of our counties best sources of clean, fuel-free, low cost energy.

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