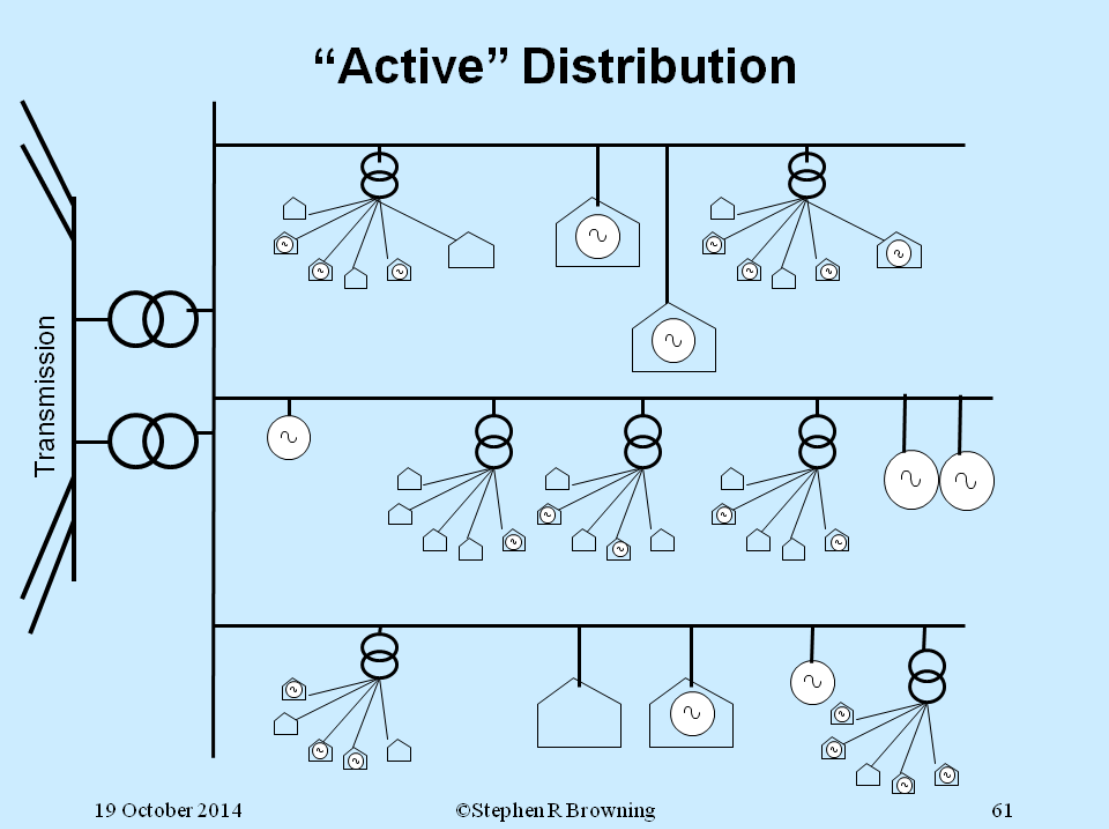
What we would expect to see under the current development framework is an increased penetration of smaller 'fuel or customer requirement' driven, unobservable, distributed generation of different types at different levels.

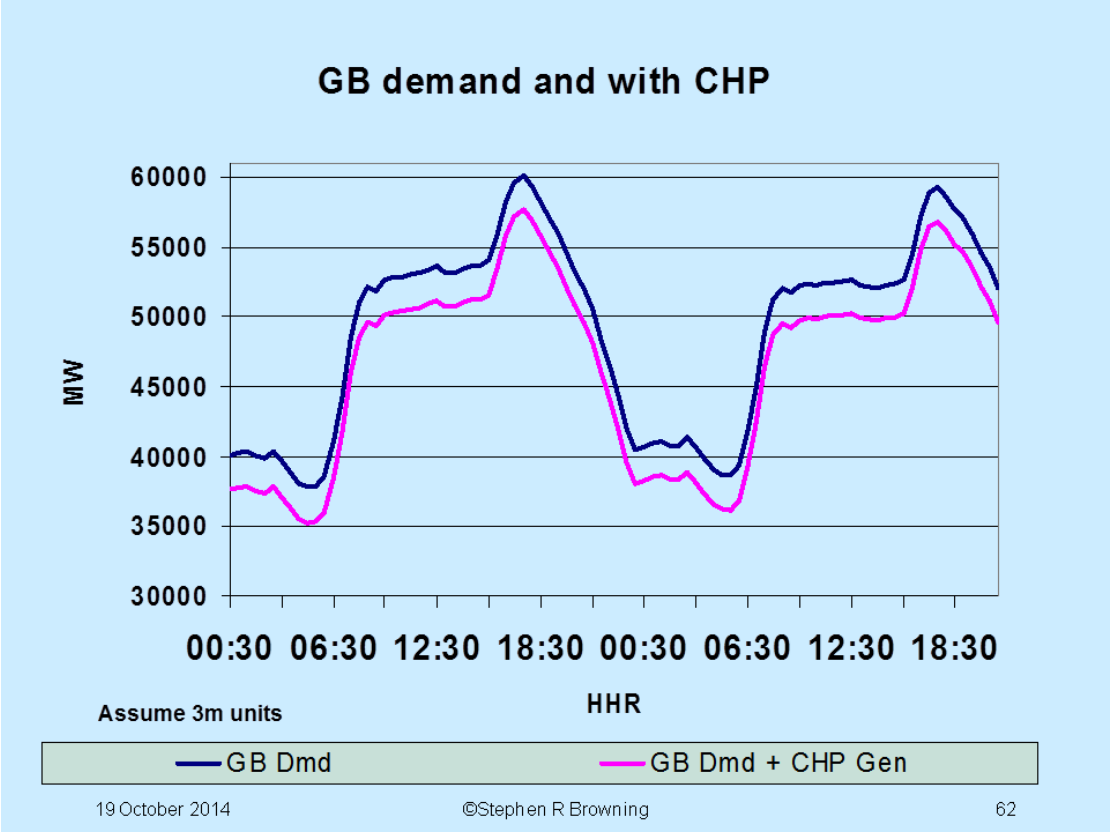


At domestic level we have Micro CHP, PV or Wind technology. PV is expensive, due to local turbulence Wind gives low yield at roof height and CHP systems (boiler + heat recovery turbines) are still being commercialised. However, the penetration of Micro Generation is forecast to increase.

At commercial/industrial level we have an effective market for CHP and CCHP, albeit mainly based on fossil fuels. Use of PV and some mini wind is also being applied.

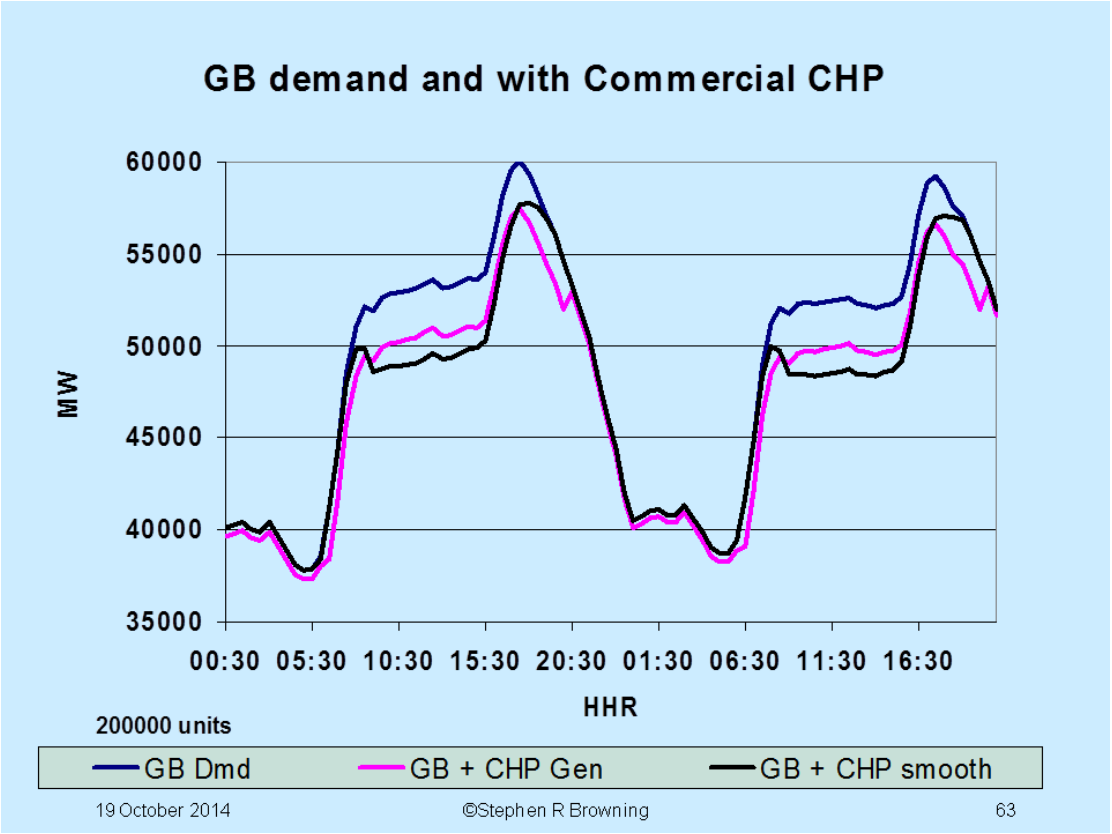
Larger stand alone Wind Generation parks are separately connected to Distribution feeders.

Uncertainty of Wind output has already been shown previously. As a further example, application of say 3m domestic CHP units in Great Britain, all working to heat requirement would have the following impact on a winter's day.

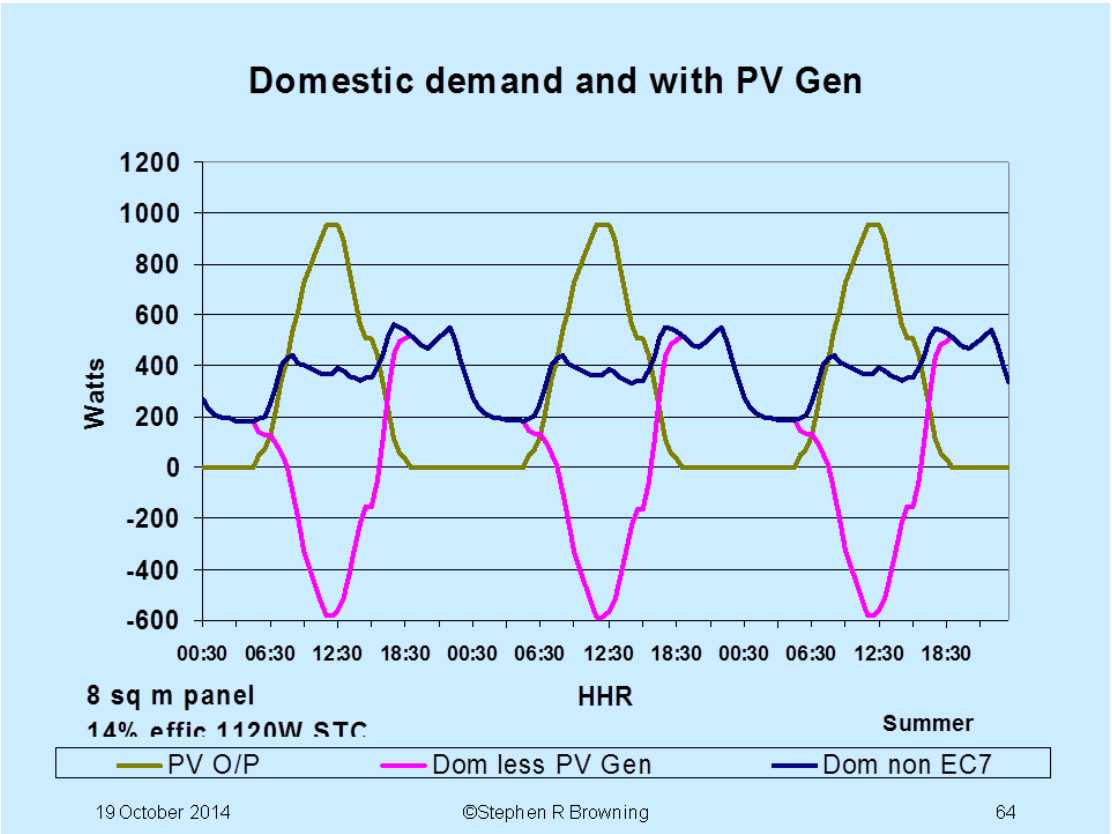


With a cold, uniform external temperature the CHP will run continuously day and night. This is not the most efficient way to reduce fossil generation output.

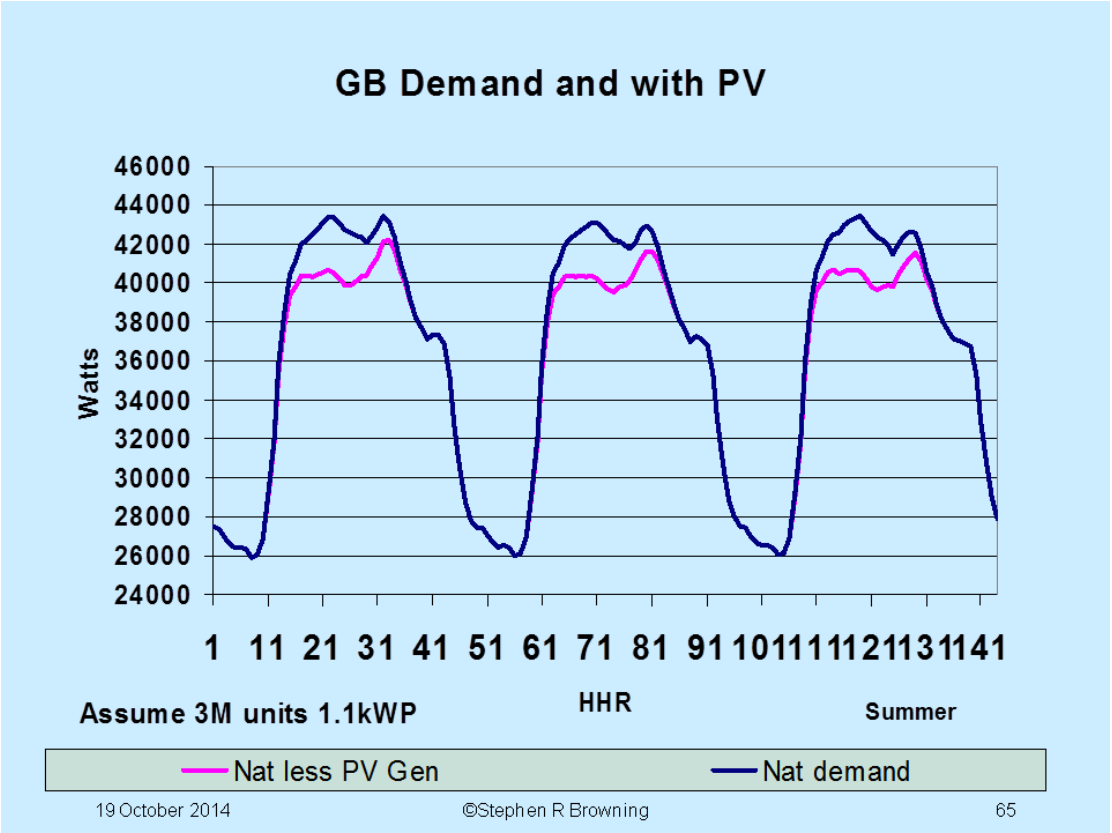
Commercial CHP only runs in the daytime period and should produce a better impact profile.



Distributed domestic Photovoltaic systems will produce maximum output during summer daylight hours while domestic premises demand is not at its maximum. This will cause the premises to export.



There have already been cases of resulting local high voltage causing the inverter to trip. As regards the National position, domestic PV output can contribute to reducing higher load levels but leaves an evening Peak. You need a lot of capacity to make a significant impact; 3 million 1.1 kWP panels against the Great Britain demand in this example.



On commercial premises, maximum PV output occurs during the building maximum demand period and is synergistic with any electrical cooling load.

The overall impact on the main system of large DG penetration would mean that generation output would have to be made observable, albeit aggregated over suitable groups; say by supply point and then by defined transmission area and Nationally. Local and aggregate prediction mechanisms will be required.

At the same time the customer 'attitude' to demand is changing. Energy use reduction and the development of energy efficient premises and processes is being progressed. Also non-time critical Electricity demand is being identified and appliance operation coordinated for use as efficient short term reserve.

To get true electricity efficiency, the need to recognise the inefficiency introduced by large demand variations over time and the need for accurate prediction and operation is crucial.