Energy intensity of industry

In the 2050 Calculator the industrial sector's future energy use is determined by two factors:

- industry energy intensity (described here) and
- industry growth (described on the previous page).

In 2013 industry was responsible for about 24% of Ireland's total primary energy requirement. [30] In addition to emissions from the energy used, the sector emitted 2.4 Mt $C0_2e$ originating in manufacturing processes. [31]

Since 2009, industry has been utilising an increasing share of electricity (36% in 2013), natural gas (28% in 2013), and renewables (7% in 2013). The increase in renewables is mainly due to the use of biomass in the wood processing industry, the use of tallow in the rendering industry and the use of the renewable portion of wastes in cement manufacturing.[32]

Industrial energy intensity is the amount of energy required to produce a unit of value added at constant prices. Between 1990 and 2013, industrial energy intensity in Ireland reduced by 43% due to an increase in energy productivity in the sector.[33]

The trajectories below offer users to choose the rate of improvement in industrial energy and emissions intensity up to 2050 and the rate of electrification in the sector.

Trajectory 1

Trajectory 1 assumes that process emissions remain constant and that there is a 17% reduction in the energy intensity of manufacturing between 2013 and 2050. The proportion of fuel used by type (electrical, solid, gas, liquid) remains the same as 2013.

Trajectory 2

Trajectory 2 assumes a 25% improvement in energy intensity; a 25% reduction in process emissions per unit of output and that 39% of industrial energy demand is met by electricity.

Trajectory 3

Trajectory 3 assumes that there is a 40% improvement in energy intensity and at least a 30% average reduction in process emission intensity. 66% of energy demanded is for electricity.

Interaction with other choices

To replace coal, gas and oil use with bioenergy in the 2050 Calculator, select bioenergy imports, or choose to dedicate land to biomass and to turn that biomass into solid, liquid or gaseous biofuel.

There may be significant demand for carbon dioxide (CO_2) transport infrastructure and storage capacity in three sectors: industry, carbon capture and storage, and geosequestration. Calculator users may wish to consider these options together to take a view on whether the total demand for CO_2 transport and storage infrastructure is feasible.

Figure 13. Industrial energy demand under energy intensity lever, (TWh/yr)

Note: Industrial growth set at Trajectory 2