

## Land dedicated to bioenergy

In 2013, Ireland used 156 km<sup>2</sup> of land to grow energy crops, which is less than 0.2% of the country. For comparison, 45,000 km<sup>2</sup> of land was used for arable crops, livestock, and fallow land.<sup>55</sup>

### Trajectory 1

Trajectory 1 assumes that in long-term land management decisions until 2050, food production has priority over bioenergy. Land is split between activities similar to today, although we are able to get more food from the land due to increased crop yields. The energy available from purpose grown energy crops is similar to today (0.4 TWh/yr).

### Trajectory 2

Trajectory 2 assumes that current trends and drivers in land management continue to 2050, with more land covered by housing. The area planted with bioenergy crops also increases to 4% of land area, such that an additional 2,300 km<sup>2</sup> of grassland is converted to the production of woody energy crops in 2050. The resulting energy available from purpose grown energy crops rises to 13.5 TWh/yr in 2050. The primary energy from forestry and wood cutting also increases to 3.3 TWh/yr.

### Trajectory 3

Trajectory 3 assumes that bioenergy becomes a significant part of domestic agricultural output, with 7% of Irish land used for growing energy crops by 2050, an area slightly larger than the size

of County Wexford and Kilkenny. There is an appreciable improvement in soil and crop management technologies, with some land now used for food crops being reassigned to bioenergy production and forestry. The resulting energy available from energy crops alone in 2050 is 32 TWh/yr. The energy from forestry and waste wood rises to 9 TWh/yr.

### Trajectory 4

Trajectory 4 assumes that Ireland has a strong domestic bioenergy production with 11% of the country planted with energy crops by 2050. There is extensive carbon capture through forestry, with double the area of forestry compared to today, and highly effective management and collection of waste materials for bioenergy use. The resulting energy available in 2050 from purpose grown energy crops alone is 63.5 TWh/y.

For comparison, Denmark's production of straw, woodchips, firewood, woodpellets, woodwaste, biogas, bio-oil, and biodiesel for energy in 2012 was 19 TWh/y. Denmark has an additional million people compared to Ireland (5.6 million in 2013) and around half the land area. Scaled by the land area ratio of Ireland to Denmark, this energy production is equivalent to around 40 TWh/y in Ireland.

Figure 34. Primary energy produced by purpose grown energy crops, (TWh (primary energy)/yr).

