Llanelli Plant Energy and Water Reduction Programmes
2022 Update

Energy.

Energy consumption is monitored and closely controlled to ensure compliance with our site's Climate Change Levy Agreement (CCLA) obligations. The site has held a CCLA agreement for the past 22 years and has maintained compliance at each milestone test. The last formal milestone performance reporting period for 2019-2020 was undertaken in March 2022. The Site prepared and submitted a dry-run dataset in 2022 using 2021 data to provide an interim forecast of performance during the reporting period. The 2022 dry-run exercise also indicated that the Site were likely to comply with the 2021-2022 formal targets set.

In 2013 the site joined Phase 2 of the CCLA scheme after successfully complying with all targets presented by Phase 1 of the scheme. The last official Milestone test considered a two-year period extending from 1st January 2019 to 31st December 2020. Performance against this baseline data is shown in Table (1.0). For illustration purposes, the performance in the intervening years, measured at CCLA dry run reporting exercises is also indicated.

Data Year	Test Type	Performance Specific Energy Consumption (GJ/MT)
2008	Baseline	24.904
2013	Dry Run	22.885
2013-2014	Milestone Test	19.808
2015	Dry Run	16.256
2015-2016	Milestone Test	17.078
2017	Dry Run	17.411
2017-2018	Milestone Test	17.979
2019	Dry Run	17.881
2019-2020	Milestone Test	17.579
2021	Dry Run	16.288

Table (1.0.) Historical CCLA Performance Targets.

These data show continued and sustained energy savings have been made, representing a 34.5% reduction in the energy required to produce a unit mass of product in the period 2008 to 2021.

In 2020 the site applied to have the current CCLA extended into Target Period 5 (TP5). The application was successful with targets being considerably tightened to align with a reduction to the 2018 baseline.

The changing product mix on site and uncertainty in production volumes due to post COVID-19 global shifts in macroeconomics and Brexit has presented many challenges in ensuring that our facility is energy efficient and meets the targets set at very diverse range of product throughputs.

In recent years there has been increased demand for products associated with a higher specific energy intensity. Therefore, greater focus has been required to ensure that existing energy performance targets are met. Across Huntsman, the performance of our site is benchmarked via internal energy KPIs with other global facilities manufacturing the same products.

Recent Energy Saving Schemes are:

Energy Savings Via Production Scheduling.
In an uncertain market, where swings in product demands can happen without warning, significant energy savings have been made via production scheduling. These arrangements ensure that the plant is run at the highest sustainable rates to allow production campaigns to be kept as short as possible. By doing so, the indirect energy losses, are reduced and energy cost savings realised. To enhance the site production planning, communication within our Supply Chain Division, Marketing and Operations Departments has been increased. Scheduled planning meetings are now regularly held and integrated scheduling tools have been implemented to support the scheduling task and make changes in the production plan readily evident to all involved.

At a global level within the company, in the face of the onset of a retraction in required product volumes, daily decisions are made regarding which facilities are operated and which are idled. These measures ensure that facilities are run at the most energy efficient throughputs to fulfil global, not just regional demand.

Plant Equipment Replacement.
With limited operating volumes, the capital expenditure and payback periods for replacement items is also inevitably restricted. To maintain energy efficiency improvements across the site, inefficient items of equipment have been identified and where, opportunistically, options exist to replace equipment higher efficiency replacements are sought.

In recent times the site has invested in increased use of variable speed drives to rotating equipment and high efficiency lighting upgrades.

Recent Water Saving Schemes are:

Maximizing Production Volumes and Plant Scheduling.
From mid-2022 production volumes declined. Previous water saving schemes have been maintained to attempt to still schedule the facility to operate in as long, protracted production campaigns as possible, although in the current climate this has been very challenging.

Operating the plant in stable, protracted campaigns, without campaign changes, means that the frequency of plant turnarounds and washouts are reduced. Washout of materials from a previous batch consumes large volumes of water, therefore reducing the number of washouts is beneficial.

In 2020 Huntsman formed a multi-disciplinary team to investigate catalyst lifespan and to optimize plant operations. These activities have realised catalyst lifespan savings, which directly affects water consumption rates. Reducing the number of occasions that catalyst needs to be replaced leads to water savings, as water is used to keep catalyst in a wetted state during changeouts and is also used to wash the reactor vessels out. Reductions in catalyst consumptions, significantly reduces site operating costs, allowing funds to be focused on other sustainability ideas, as well as reducing the considerable off-site energy demand required to re-process spent catalyst. These efforts have been bolstered by regular meetings and the site directing other sites on the savings realized, with the aim of cascading these efforts across the global business.