



Energy Analysis

Grundisburgh Village Hall - Dec 2021 - Apr 2023

Green technology enabled operational net carbon neutrality & significant cost savings

- ▶ Grundisburgh Village Hall has almost 15kWp of solar panels installed.
- ▶ The solar panels have enabled the village hall to:
 - ▶ Produce more electricity than is used by the village hall on an annual basis
 - ▶ Be net carbon neutral based on electricity exports and imports
 - ▶ Reduce annual energy costs by 80% and save almost £3,200 to date
- ▶ Saved over £350 using an air source heat pump vs gas central heating
- ▶ Additionally the village hall has helped avoid over 3,500kg of CO2 emissions through solar electricity consumed onsite, EV chargers and air source heat pump for heating.
 - ▶ This is the equivalent to the average UK household's energy emissions
- ▶ The solar panels were installed thanks to funding through a combination of:
 - ▶ Over £6,000 of generous donations from the local community
 - ▶ Support and involvement of Suffolk County Council in its ambition to Create the Greenest County through the Green Suffolk Fund grant and Councillor Elaine Bryce's locality grant
 - ▶ The Enabling Communities Budget grant from East Suffolk Council District Councillors
 - ▶ Grundisburgh Parish Council's environmental CIL receipts
- ▶ See notes page for information about figures presented in this analysis

Costs and savings

- ▶ Despite record high energy prices during 2022, the solar panels have ensured the energy costs for the village hall have been kept in check
 - ▶ Saved almost £3,200 to date with over £3,000 on annual basis Apr 22 - Apr 23 ¹
 - ▶ Net costs Dec 2021 - Apr 23 were less than £1,400 ²
 - ▶ Net costs on an annual basis Apr 22 - Apr 23 were approximately £600 ²
- ▶ Saving over £350 vs gas heating for heating season Oct 22 - Apr 23 ³
- ▶ Customer EV car charging has covered fixed costs and electricity usage ⁴

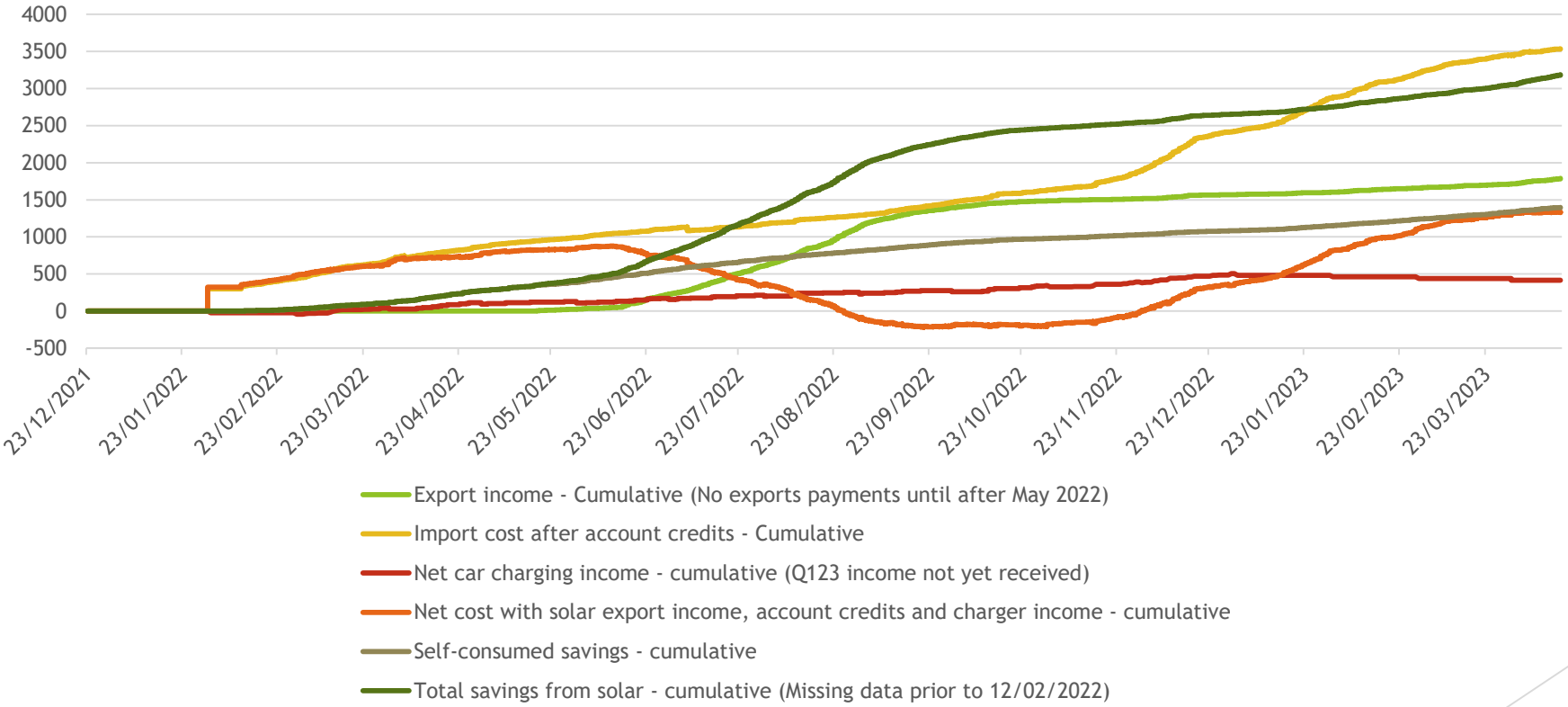
¹ No savings information prior to Feb 22 and export payments only received after May 22

² After solar export + EV charger income + account credits (Q1-23 charger income will further reduce net costs)

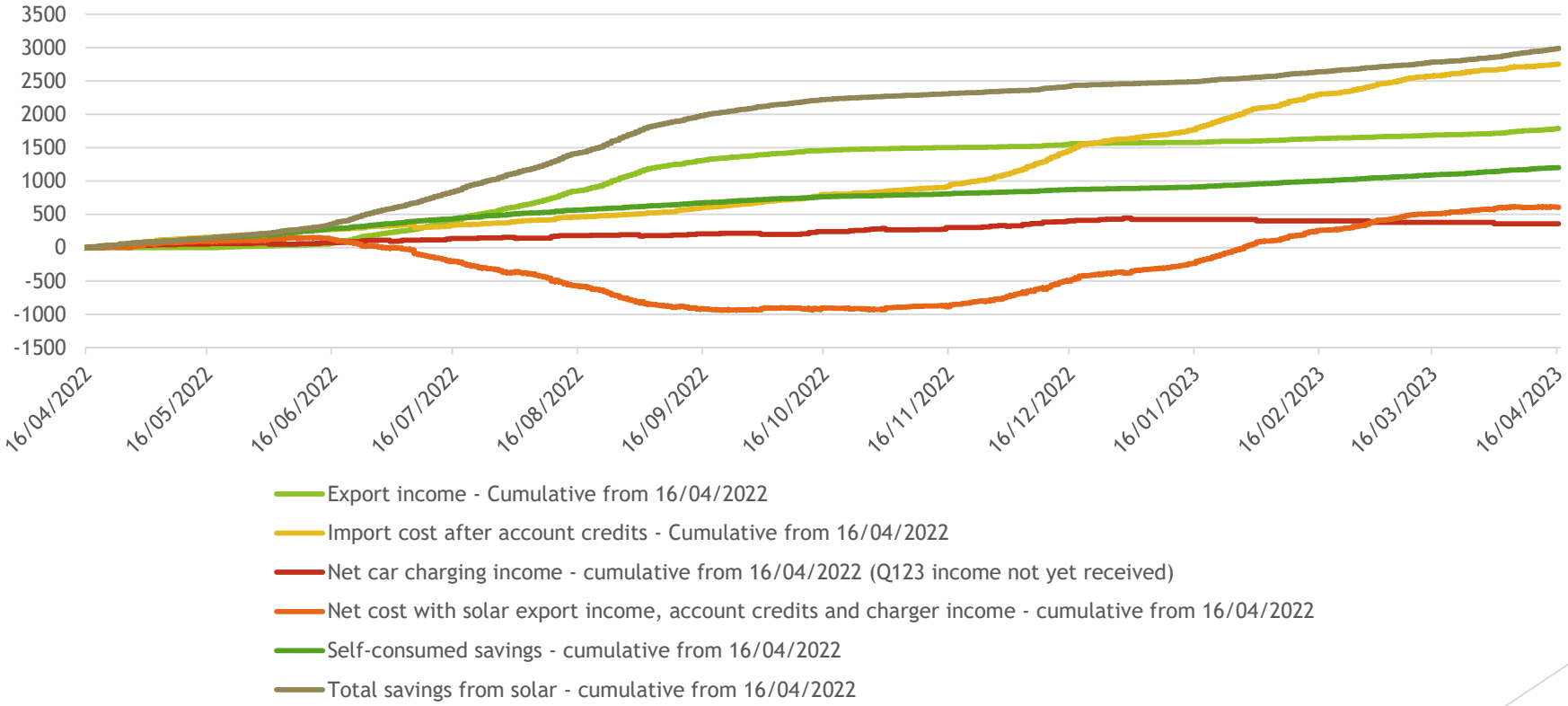
³ Assume 90% efficiency of gas boiler and using government EPG rates and standing charges

⁴ Q1-23 charger data not yet available

Energy costs and savings: All time



Energy costs and savings: Apr 22 - Apr 23



Carbon emissions & savings

- ▶ Village Hall was carbon neutral on annual basis from April 2022 - April 2023 (excluding electric car charging ¹)
 - ▶ 2,070kg of CO₂ emissions avoided as a result of unused solar generation exported exceeded the 1,800kg CO₂ emissions from electricity imported for use in the village hall
 - ▶ 426kg of CO₂ emissions from 1,917kWh of electric car charging
 - ▶ Provided 4,888¹ miles of driving saving 890kg CO₂ vs the average UK petrol\diesel car ²
- ▶ Over 795kg of CO₂ emissions avoided as a result of electricity used onsite generated from solar panels
- ▶ 1,500-2,180kg CO₂ emissions avoided vs gas heating between Oct 22 - Apr 2023
 - ▶ ASHP CO₂ emissions of 680kg - 1360kg maximum ³
 - ▶ Gas central heating emissions would be 2860kg ⁴

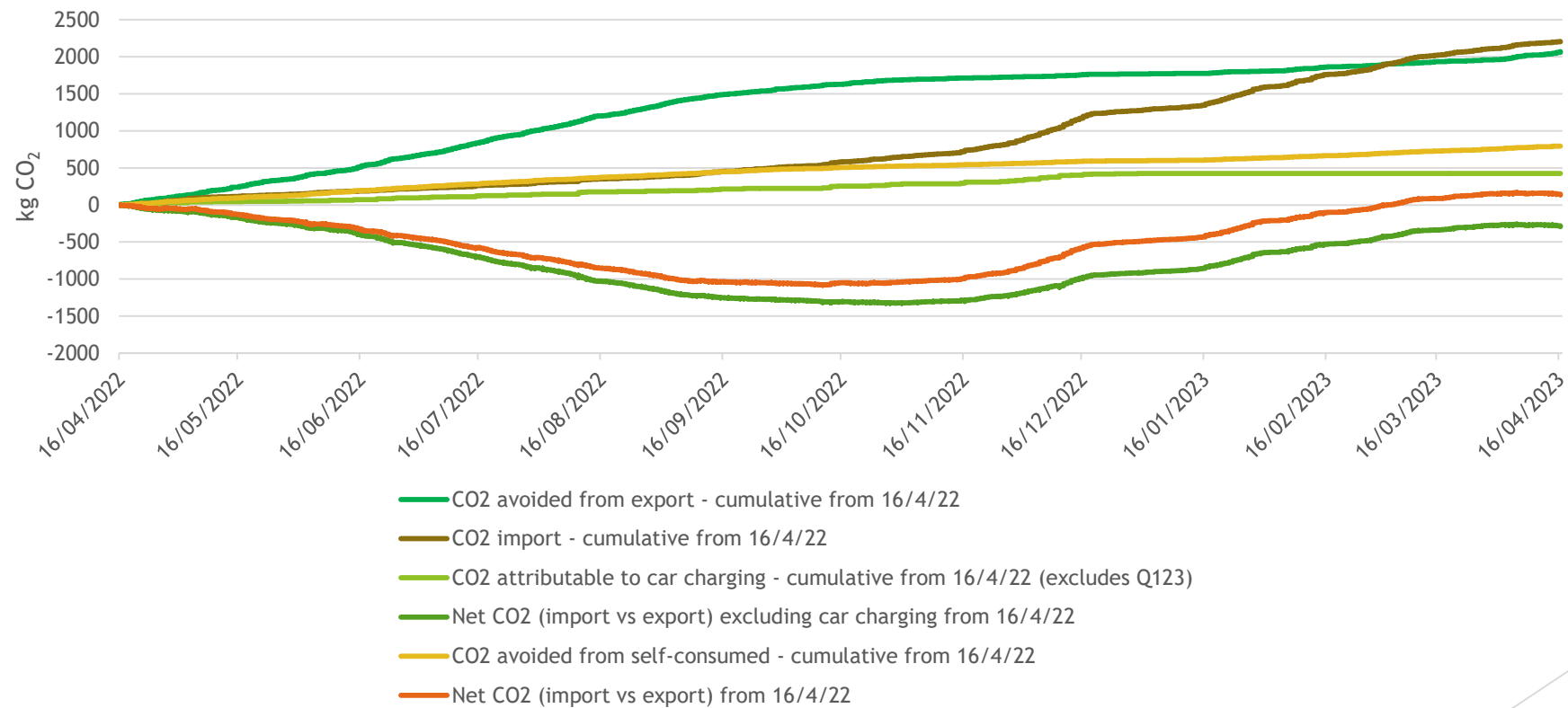
¹ Q1-23 charging data not yet available so import emissions and net position will be further improved

² 2.55 miles \ kWh & 270g CO₂ \ mile for average car: BEIS Greenhouse gas reporting: conversion factors 2022

³ 180g CO₂ \ kWh average over period (maximum of a single 30 minute period 350g) per National Grid data

⁴ Assume 90% efficiency of gas boiler and 180g CO₂ \ kWh gas: BEIS Greenhouse gas reporting: conversion factors 2022

Carbon emissions: Apr 22 - Apr 23



Energy usage

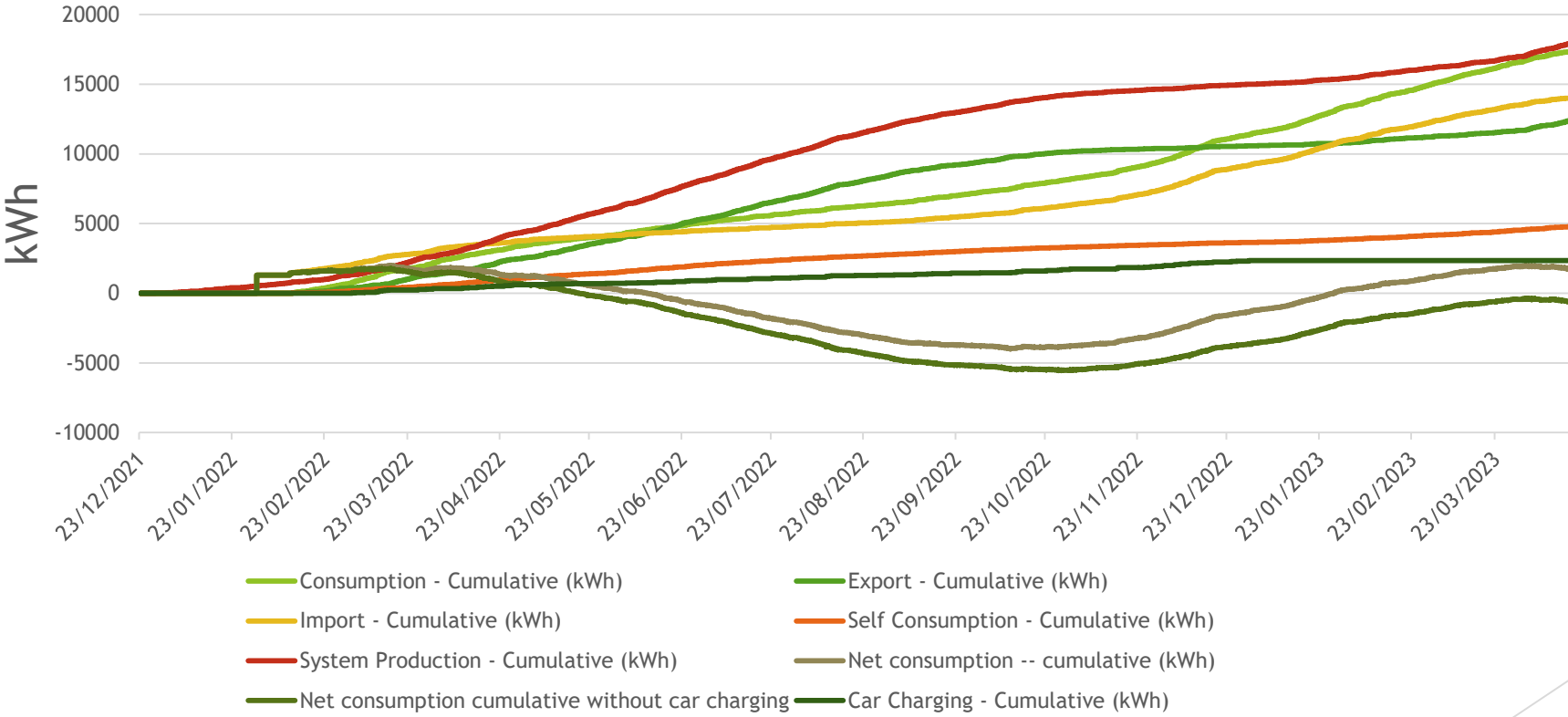
- ▶ Almost 18,000kWh of solar electricity generation since Dec 2021
- ▶ Annual Village Hall Energy consumption including heating are approximately 12,000 kWh (excludes customer's electric vehicle car charging)
 - ▶ Village Hall energy needs are covered on annual net basis from solar generation (April 2022 - April 2023) ¹
 - ▶ Onsite events such as weddings can utilise significant amounts of energy
- ▶ Air Source Heat Pump provides the heating for the village hall and used 3,740kWh across the heating season (Oct 22 - Apr 23 ²)
 - ▶ Over 14,300kWh of heat delivered to the village hall across the heating season by the ASHP (SCOP of over 3.8). Tuning of the ASHP to achieve best efficiency is ongoing but near completion.
 - ▶ ASHP electricity is provided primarily by grid import over heating season and is supplemented by solar generation when available
- ▶ Almost 2,000kWh supplied for customer electric car charging between Feb and Sep 2022 ³

¹ An additional 72kWh was needed to cover customer electric vehicle charging

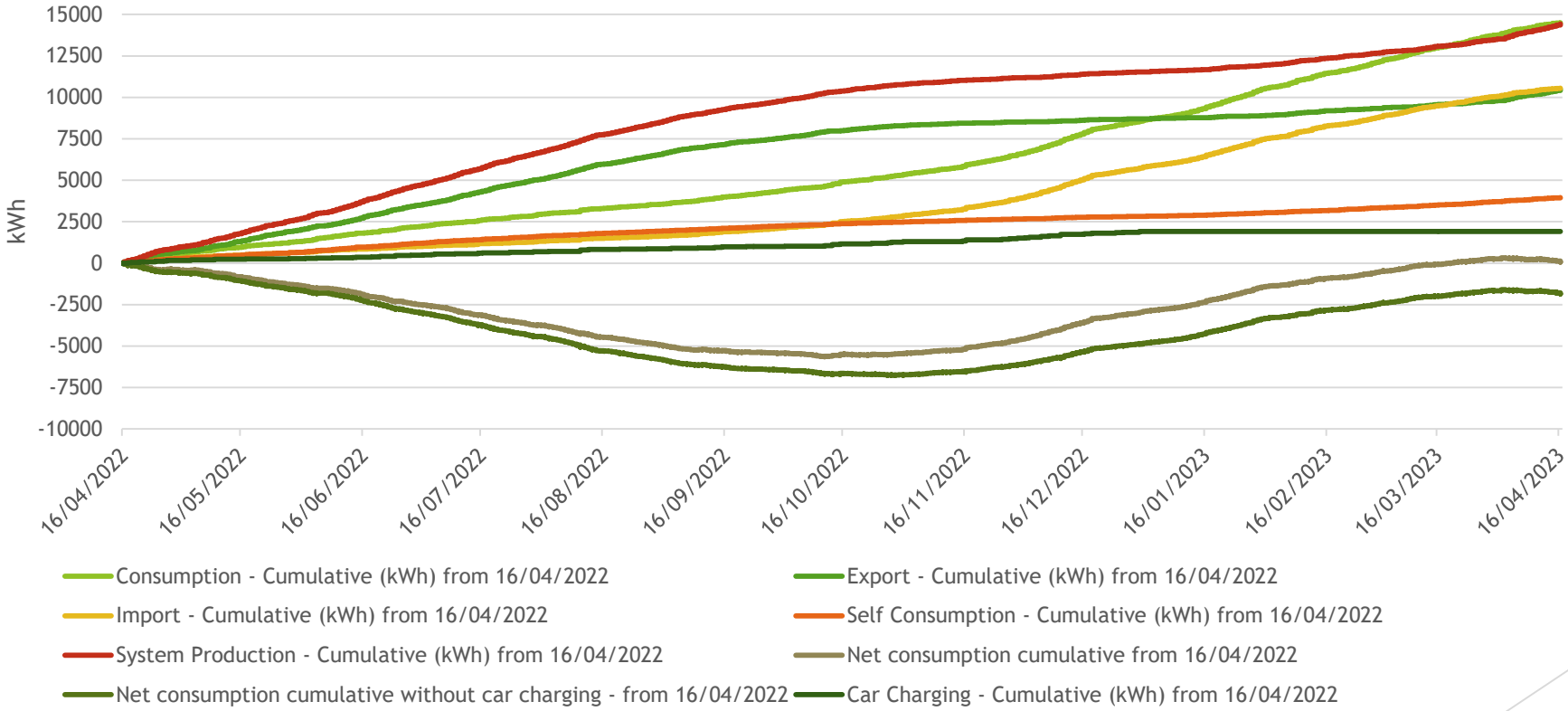
² Accurate figures only available for 22-23 heating season (Oct-Apr) as heat pump not installed until Feb 2022

³ Q1-23 charging data not yet available (expected to be between 500-1,000kWh)

Energy usage: All time



Energy usage: Apr 22 - Apr 23



Notes

- ▶ Accurate records for self-consumption, import and export started 12 Feb 2022. Prior to this date, there was no data for export and self-consumption and import usage and cost data is taken from bills and applied at bill date
- ▶ CO₂ emissions for electricity are from National Grid's Carbon Intensity API
 - ▶ The figures used were the national grid UK national average for each 30 minute time slot to ensure usage\generation reflects actual carbon intensity for that time period
 - ▶ National Grid states “this includes emissions from all large metered power stations, interconnector imports, transmission and distribution losses, and accounts for national electricity demand, embedded wind and solar generation.”
 - ▶ These figures appear to be approximately 13% lower for 2022 than those in the BEIS Greenhouse gas reporting conversion factors 2022. Therefore 15% has been added to the figures published by the National Grid's Carbon Intensity API
- ▶ CO₂ figures for gas heating are based on BEIS Greenhouse gas reporting conversion factors 2022
- ▶ EV car charging CO₂ is averaged across each charging session