

A UK all-renewable electricity supply is closer than expected at da21 AGM 2015

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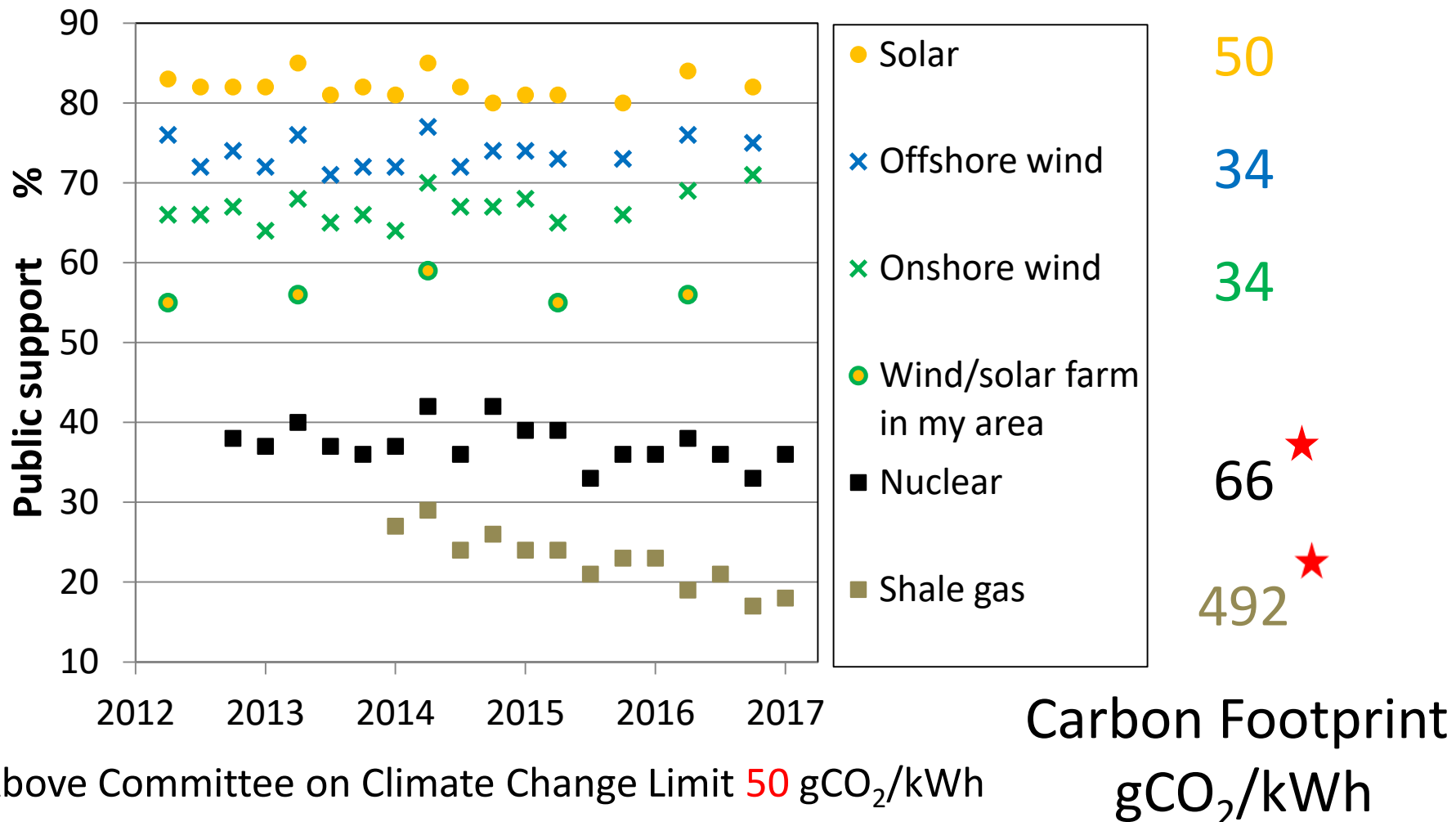
*The Burning Answer:
a User's Guide to the Solar Revolution*
Weidenfeld and Nicholson 2014

www.burninganswers.com

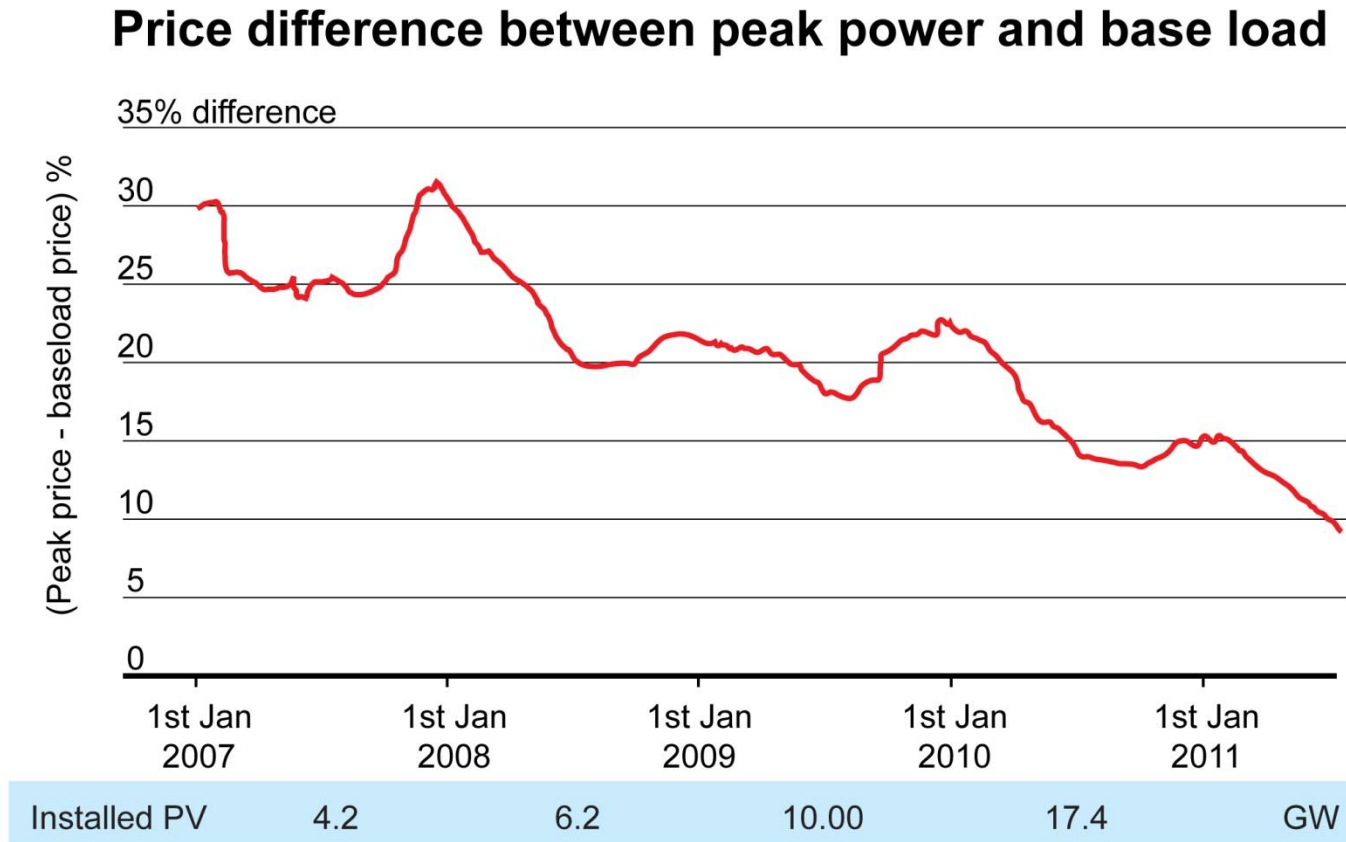
Popularity & carbon footprint of renewables & government priorities: nuclear + fracking

BEIS Public Attitudes Tracker , Nugent & Sovacool, Energy Policy, 65, 229, 2014

<https://www.theguardian.com/environment/2017/may/10/challenge-conservatives-energy-priorities-cuts-renewables>

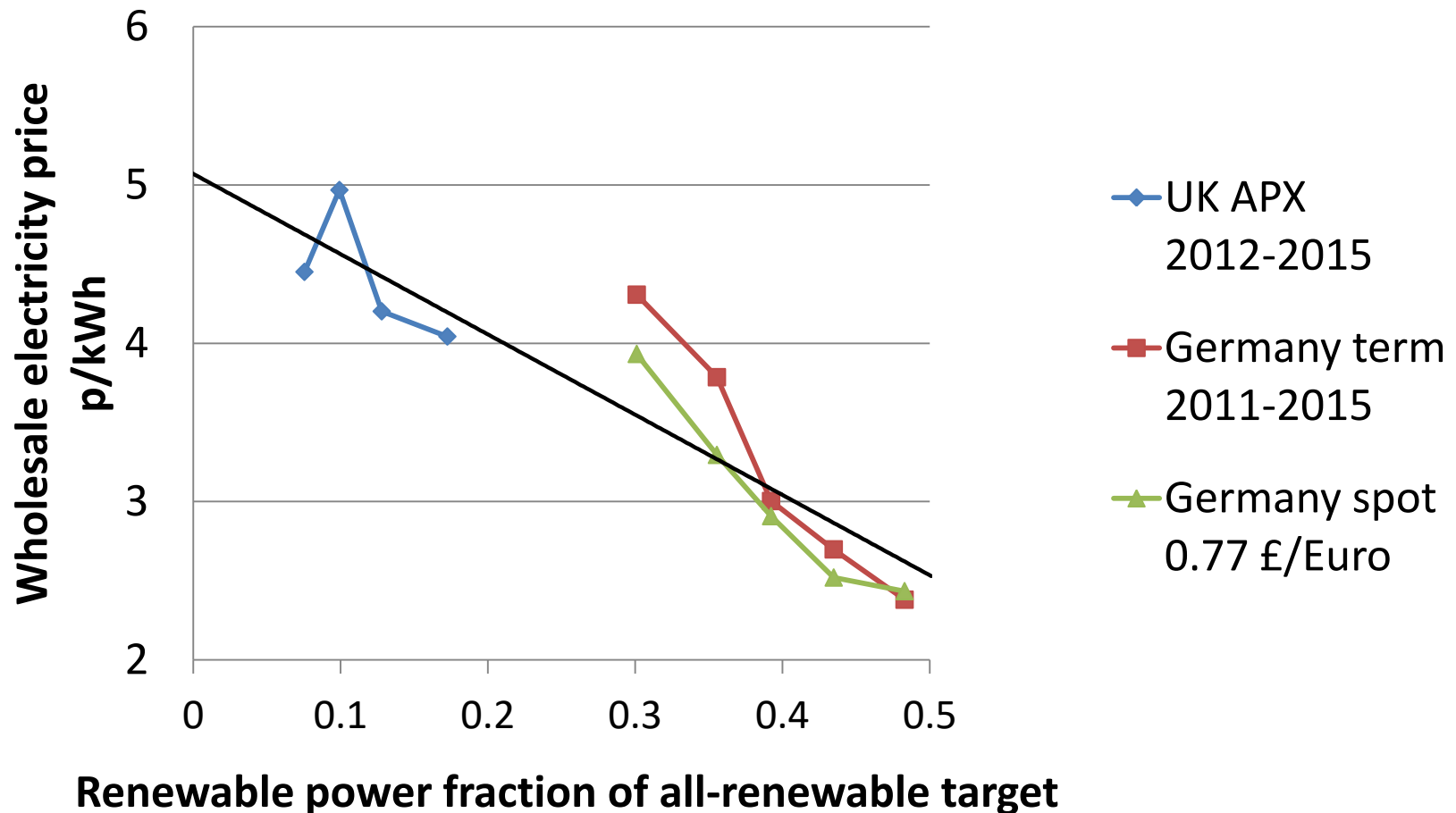


The Mystery of the Falling Cost of Wholesale Electricity in Germany



How has PV reduced wholesale electricity price when in 2011 only 3% of German electrical energy from PV?

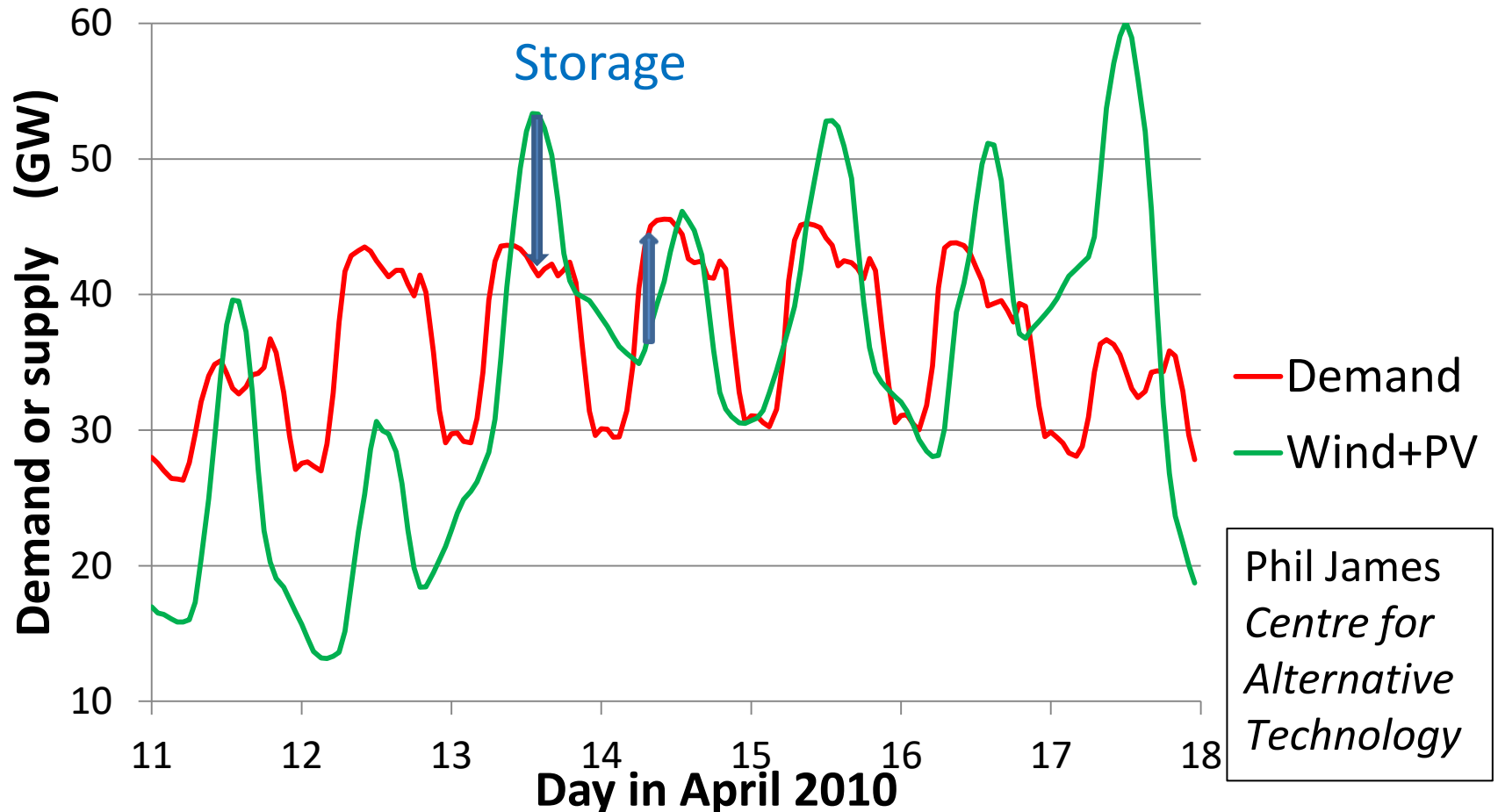
UK wholesale price fall consistent with fall in Germany



- Good Energy showed 2014 fall in UK due to cheaper renewables

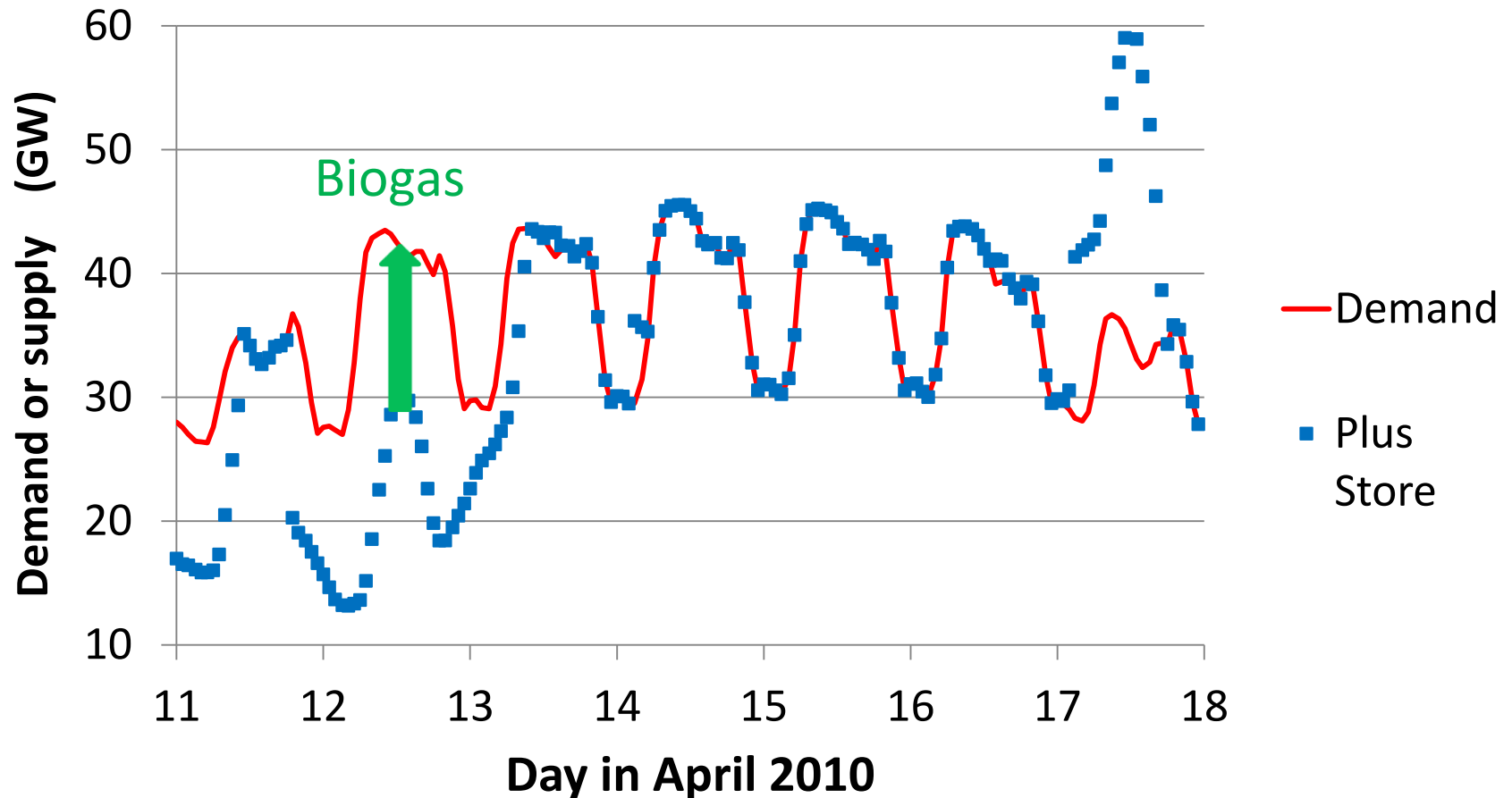
PV + Wind in an all-renewable UK

Get it from the sun (GIFTS) spreadsheet



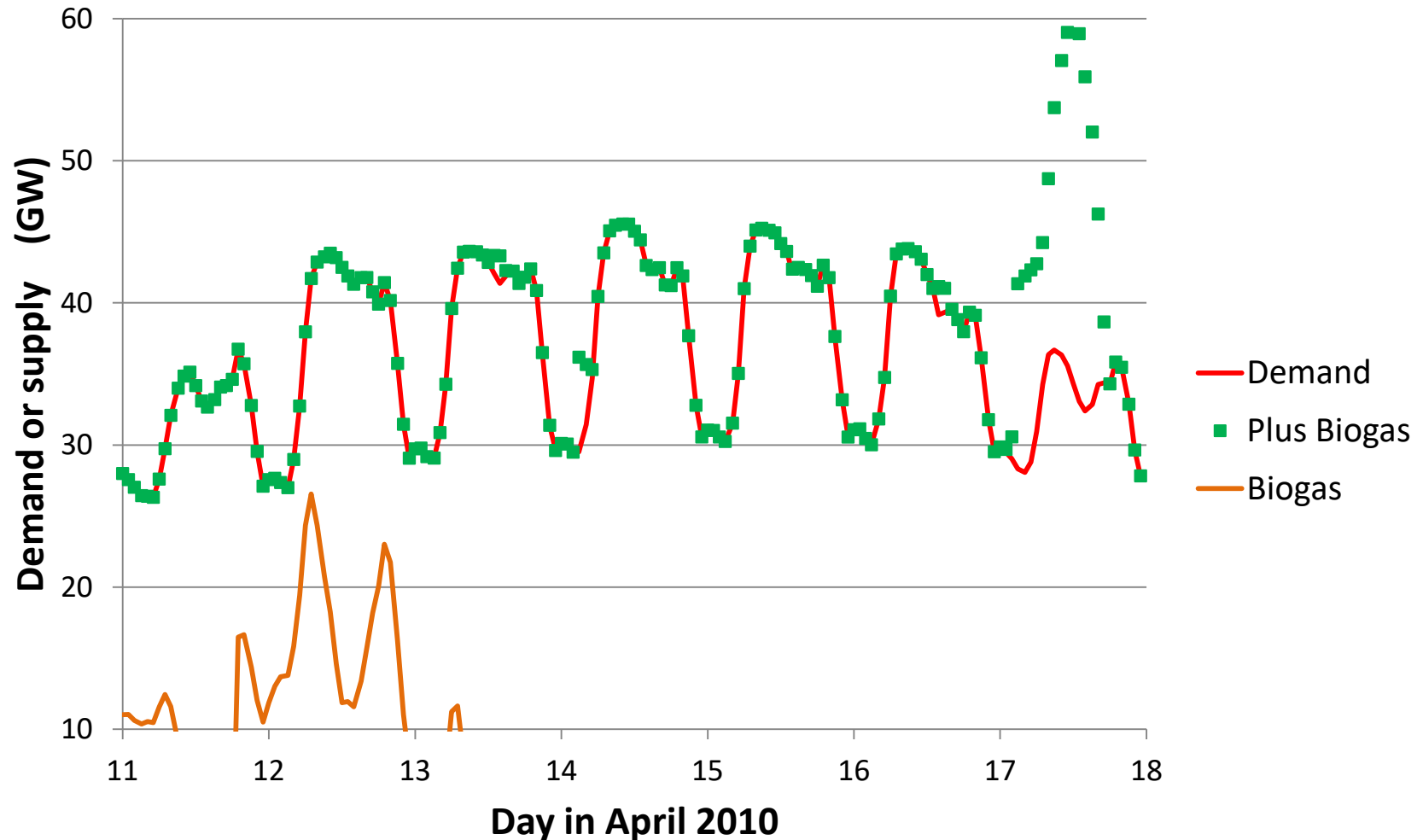
- (PV & Wind) = 80% is first approx. to typical week's demand
- Kombikraftwerk: Germany back-up 5% storage, 15% biogas

(PV + Wind) (80%) & Storage (5%)



- Flexible biogas electricity backs-up PV & wind
- Inflexible nuclear power will be redundant

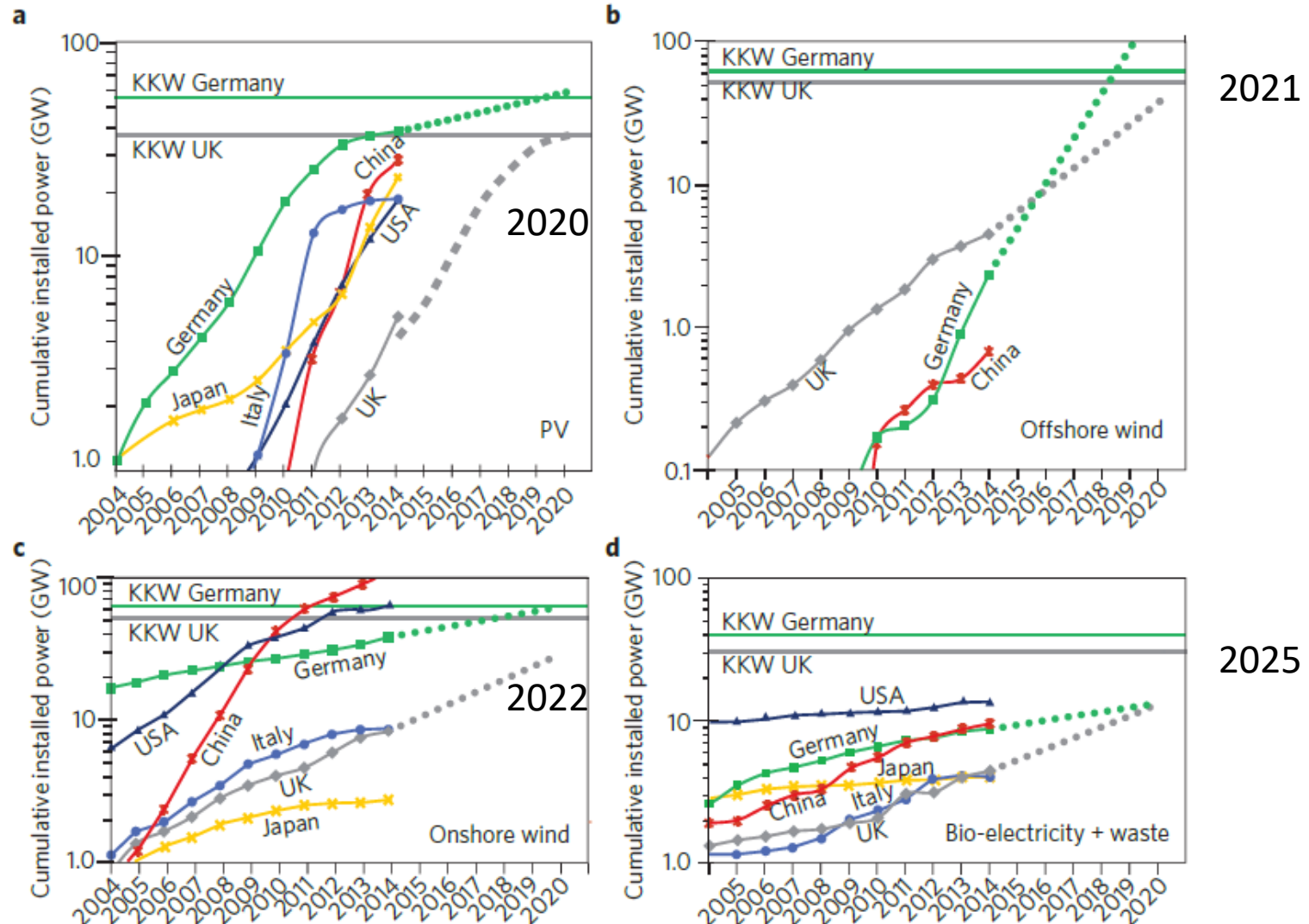
Supply less than Demand: Biogas



- (15-20)% biogas to back-up all year as in Germany
- Ideally biogas from Anaerobic Digestion (AD) of waste

Without Tory cuts UK could have had all-renewable electricity supply by 2025

Keith Barnham et al. *Nature Materials* **15**, 115, 2016



Flexible secure cheap: anaerobic digestion (AD)

- Farm animal waste & crop waste, plus food waste decay to bio-methane for **electricity** and **gas** grids
- Very low carbon footprint: avoids waste rotting on ground or in landfill to produce greenhouse gases
- Big government subsidy for diesel generators on/off
- AD constant: supply gas grid when not electricity
- If subsidise bio-waste collection, AD price < fracking



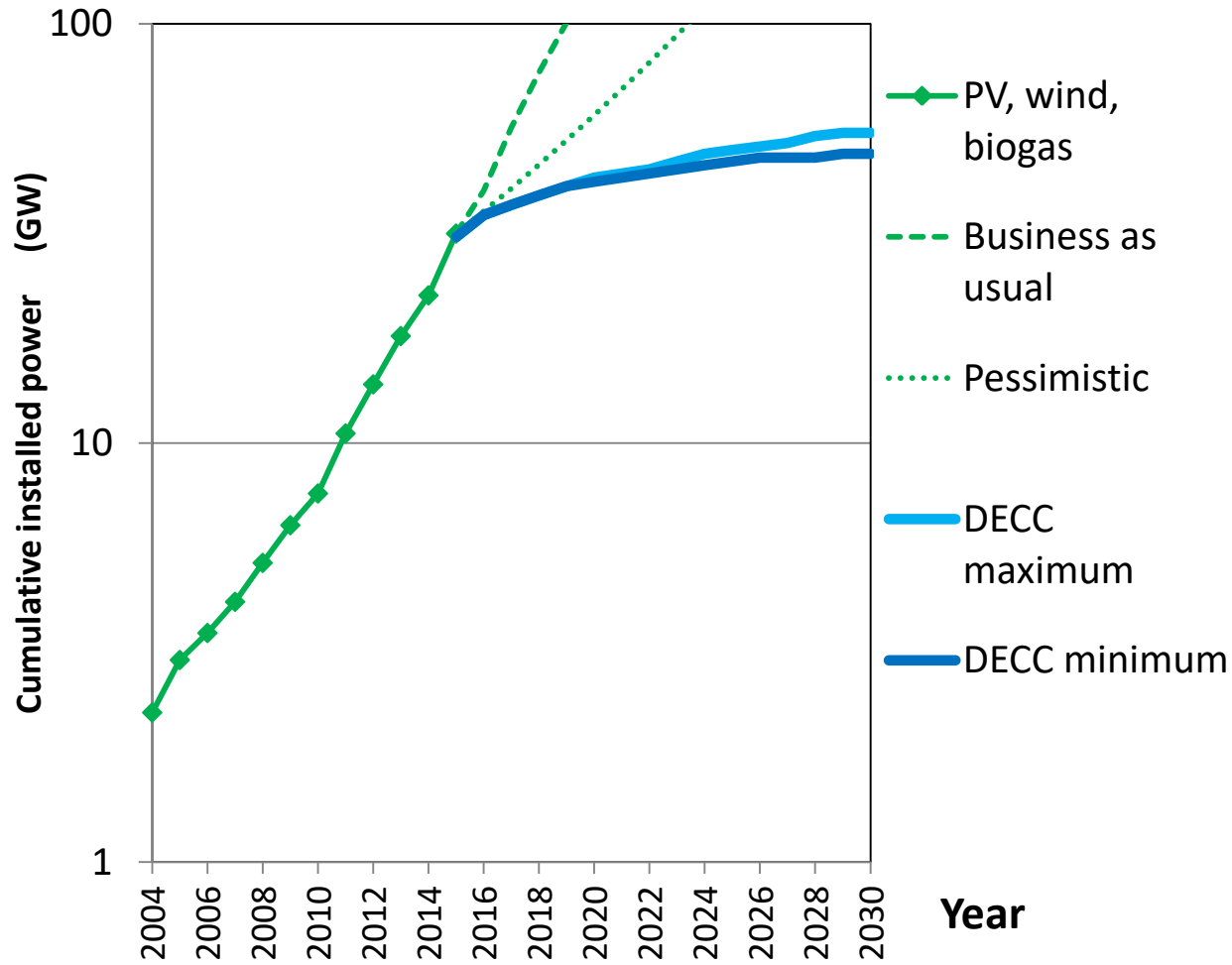
How much renewable power does the UK have?

Hinkley Point C (HPC) may produce 3.2 GW in 2030

Does the UK have:

- 1) Less renewable power than HPC may produce?
- 2) About the same amount of renewable power?
- 3) Twice the renewable power of HPC?
- 4) 10 times as much renewable power as HPC?

Possible effects of UK subsidy cuts

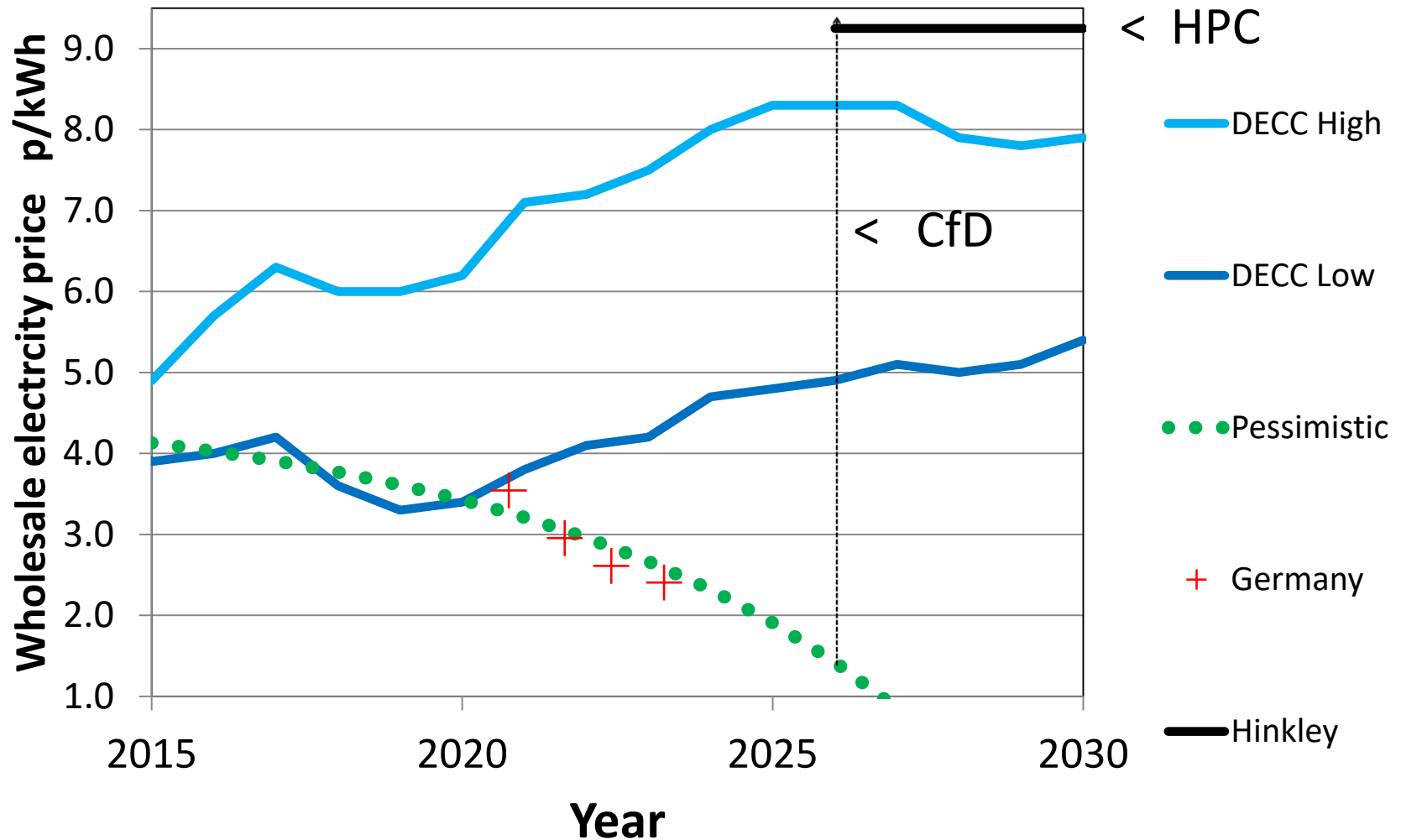


- 2020–30 increase mainly offshore wind (Amber Rudd)

Get it from the sun (GIFTS) Challenge

- Which school, town, local authority, country will be first to an all-renewable electricity supply. Could it be Dorchester?
- Aims to maintain local expansion of renewables despite cuts
- Monitor progress locally with *GIFTS* spreadsheet
- Encourage Local Authorities to:
 - build AD systems for local farm & food waste
 - arrange power purchase agreements for schools & co-ops
- Encourage individuals to switch to all-renewable electricity

Wholesale electricity prices 2025



- DECC assumes natural gas dominates price – fracking expensive?

Power changes energy

Gareth Bale has high
energy of motion

The ball has no energy
of motion in the photo

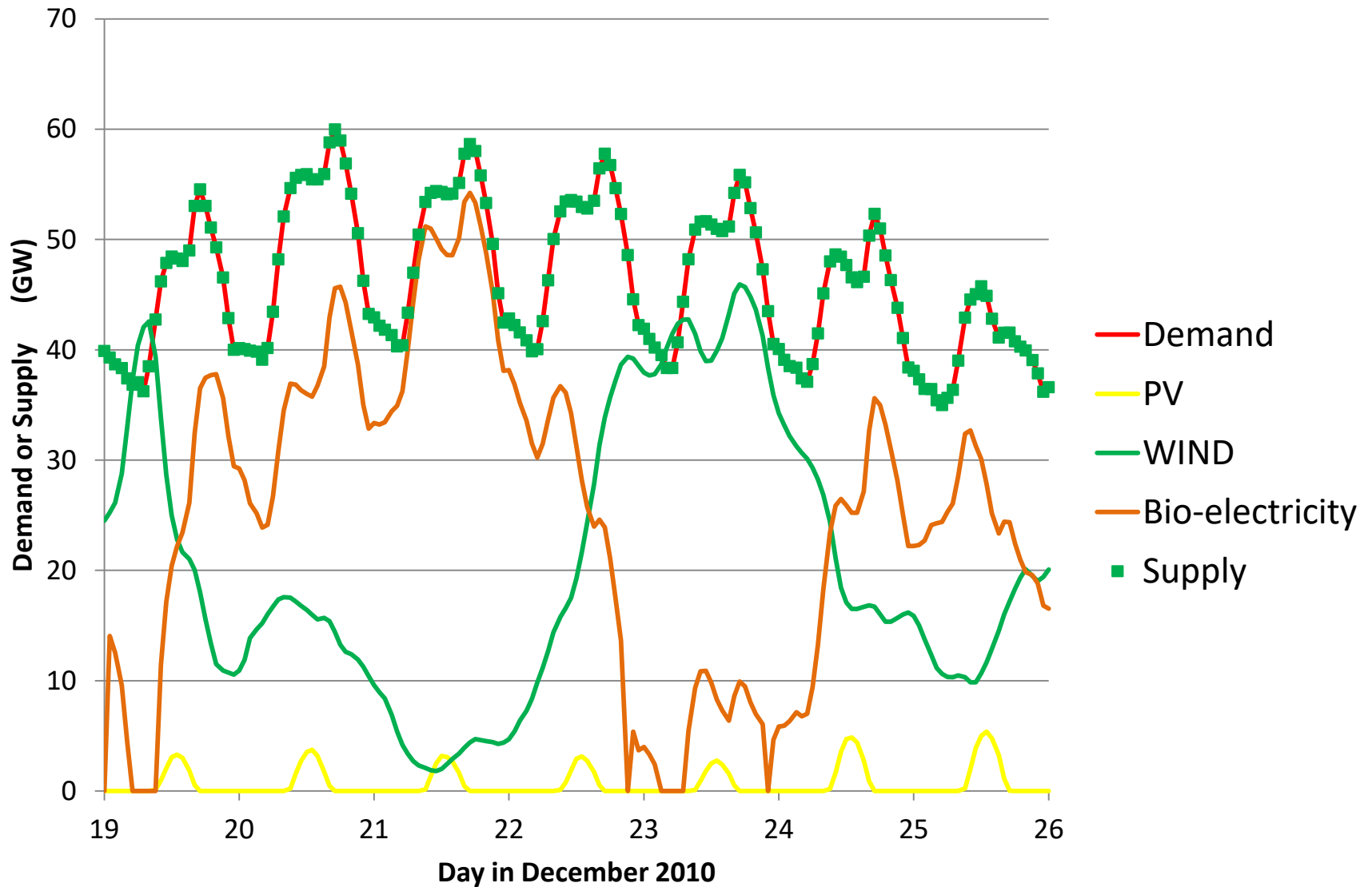
His left foot is about to
power the ball with a
small energy of motion

An instant later, higher
power in his right foot
will give the ball higher
energy of motion



Power at the right time gives
the ball high energy of motion

Who's cooking Christmas dinner?



20th Mar. 2015 - Solar eclipse in Germany

