



PV FINANCING WORKSHOP:

“SUITABLE BUSINESS MODELS & FINANCIAL SCHEMES
FOR PV DEVELOPMENT IN EUROPE”

BRUSSELS, 20TH FEBRUARY 2016



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DISCLAIMER

- The contents of this presentation are based on the market experience of Giles Clark and in the UK and elsewhere
- Where figures are given, they do include estimates which represent the position as Primrose sees it in Q1 2016
- Other market participants may see different data and have other views
- This presentation doesn't include any information which Primrose considers to be market sensitive – Information given is either Primrose's own view or based on publicly available data



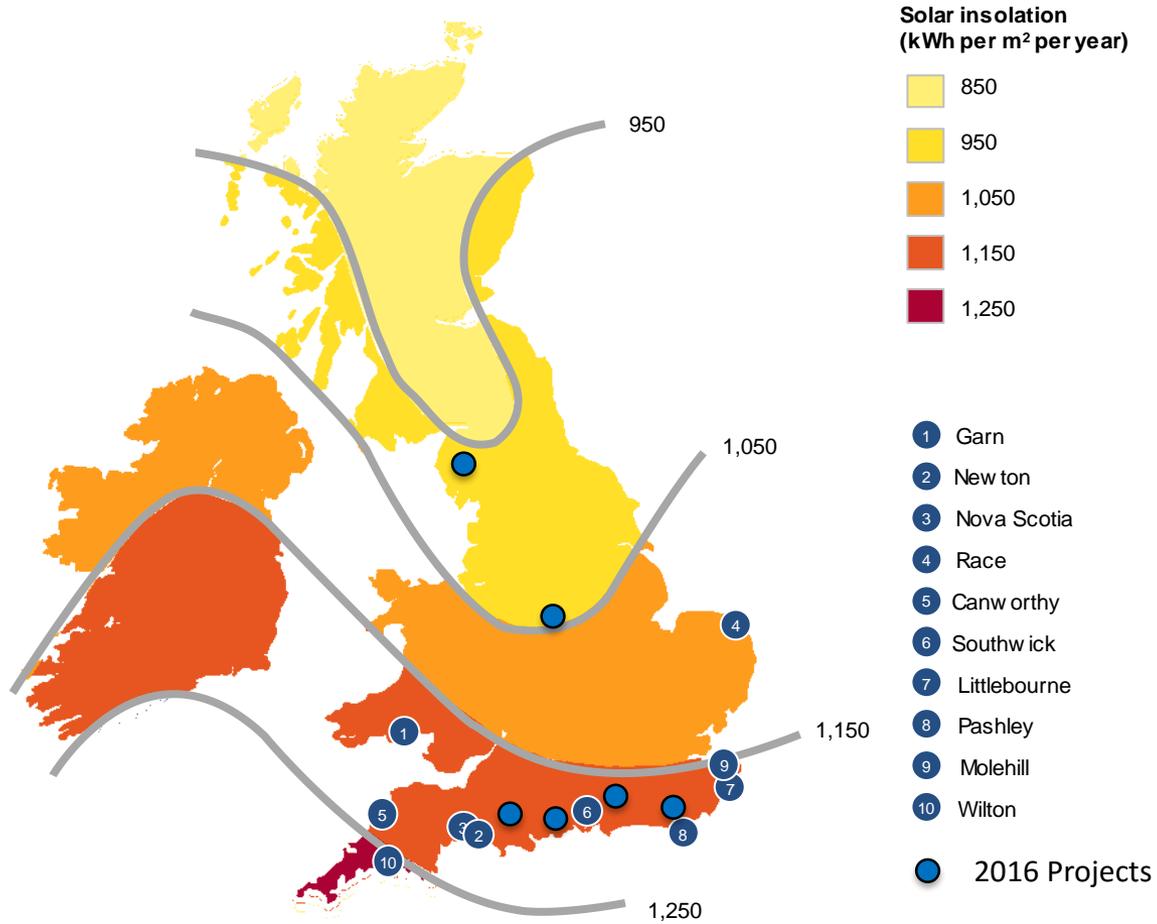
INTRODUCTION

- Primrose Solar was founded in Q4 2013 to invest in the construction of ground mounted solar in the UK
- Investor base includes a large US hedge fund
- Primrose has built 203 MW of solar in the UK and has another 50 MW under construction. Portfolio includes 3 of the largest sites in the UK (41, 48 and 50 MW)
- All sites built under the RO with investment grade PPA support
- 80 MW refinanced with long term debt from M&G in 2014
- 95 MW sold to a UK yieldco in Q1 2016

- Primrose CEO, Giles Clark, has worked in solar since 2006.
- CFO and founder at Sunray which developed and sold a pipeline of 1.2 GW to Sunpower in 2010
- Experienced investor in ground mounted solar and familiar with other solar business models



PORTFOLIO





EVOLUTION – UK SUBSIDY REGIMES

- Three different support mechanisms in the UK
 - Market opened in Q2 2010 with FiT for rooftop and ground solar.
 - Subsidy value under 2010 FiT was £385-529/MWhr
 - Strong market response (mostly rooftop) led to FiT reductions in 2011 and subsequent market collapse
 - 2nd and stronger phase of activity 2013-2016 dominated by ground mounted solar built under the Renewables Obligation (RO) mechanism
 - RO is a hybrid with asset revenue derived from:
 - RO certificates at £44/MWhr per RO in 2016
 - Market PPA, where value has fallen from £50+/MWhr to £35/MWhr
 - Total revenue for an RO asset in 2016-2017 is £85/MWhr
 - Auction based CFD mechanism introduced in 2015. Only one round held and limited number of solar contracts offered at £50-79/MWhr
 - Government has tended to underestimate appetite for subsidy and has responded by withdrawing and curtailing subsidies



EVOLUTION – VOLUME & VIABILITY

- Total solar PV deployed at the end of 2015 is 10GW+ in the UK, of which an estimated 6GW+ is ground mounted (predominantly under the RO)
- Estimated total capex to date is £12-15bn, including grid and project rights
- Asset ownership remains fragmented with perhaps 50% of ground mounted solar in the hands of large investors (biggest is Octopus with 1GW)
- Different classes of investor with different costs of capital and business models:
 - Tax advantaged investment vehicles (EIS/VCT or Inheritance Tax relief) will invest at very low yields. Asset IRR of 4-6%. Will fund construction
 - Yieldco. Approx 7% yield (based on published market data) and will only buy operating assets
 - Private Equity at 8-10% depending on attitude to risk. Will fund construction
 - Community projects at 6-7% (yield offered in prospectus) with crowdfunding.
 - EPCs who fund construction to maximise margin or in hope of launching a yieldco
 - Developers who can make 50%+ IRR *if* they succeed



EVOLUTION – SATURATION AND MATURITY

- Volume of solar deployed (DECC figures so about 1GW understated)
 - Cumulative 1GW at end of 2011
 - 2 GW total in 2012-2013
 - 6GW total in 2014-2015
- Investor yields squeezed from 2013 to 2016
 - Developers have increased the fee for project rights from £150k/MWp in 2013 to £300k+/MWp in 2015. Resistance to reducing in line with falling subsidy and PPA value
 - Increase in the number of investors chasing projects
 - Construction seen as less risky, very low failure rate despite winter build
- Market maturity evidenced by emergence of UK specific yieldcos (e.g Bluefield, Next, Foresight)
- Banks and other financial institutions comfortable with solar as an asset class
- Pension funds still under-represented
- Expectation of secondary market consolidation in 2016+



EVOLUTION – FALLING WHOLESALE POWER

- In 2014 H1 long term PPA with investment grade counterparties available at £50+/MWhr
- Comparable PPA in H1 2016 is at £35/MWhr if available
- This reduction was not expected, general fall in forward power curves
- Net of Opex, this reduces project EBITDA by about 15-20%
- This in turn reduces the value of operating assets and willingness to fund new construction, except for investors with a low cost of capital and willingness to hold long term at these prices
- Power price volatility increases the perceived risk of solar
- UK energy policy perceived as short term and as increasing power price volatility
- Grid is congested
- Capacity market payments depress wholesale power prices and skew the market



EVOLUTION – NEW MODELS POST-SUBSIDY

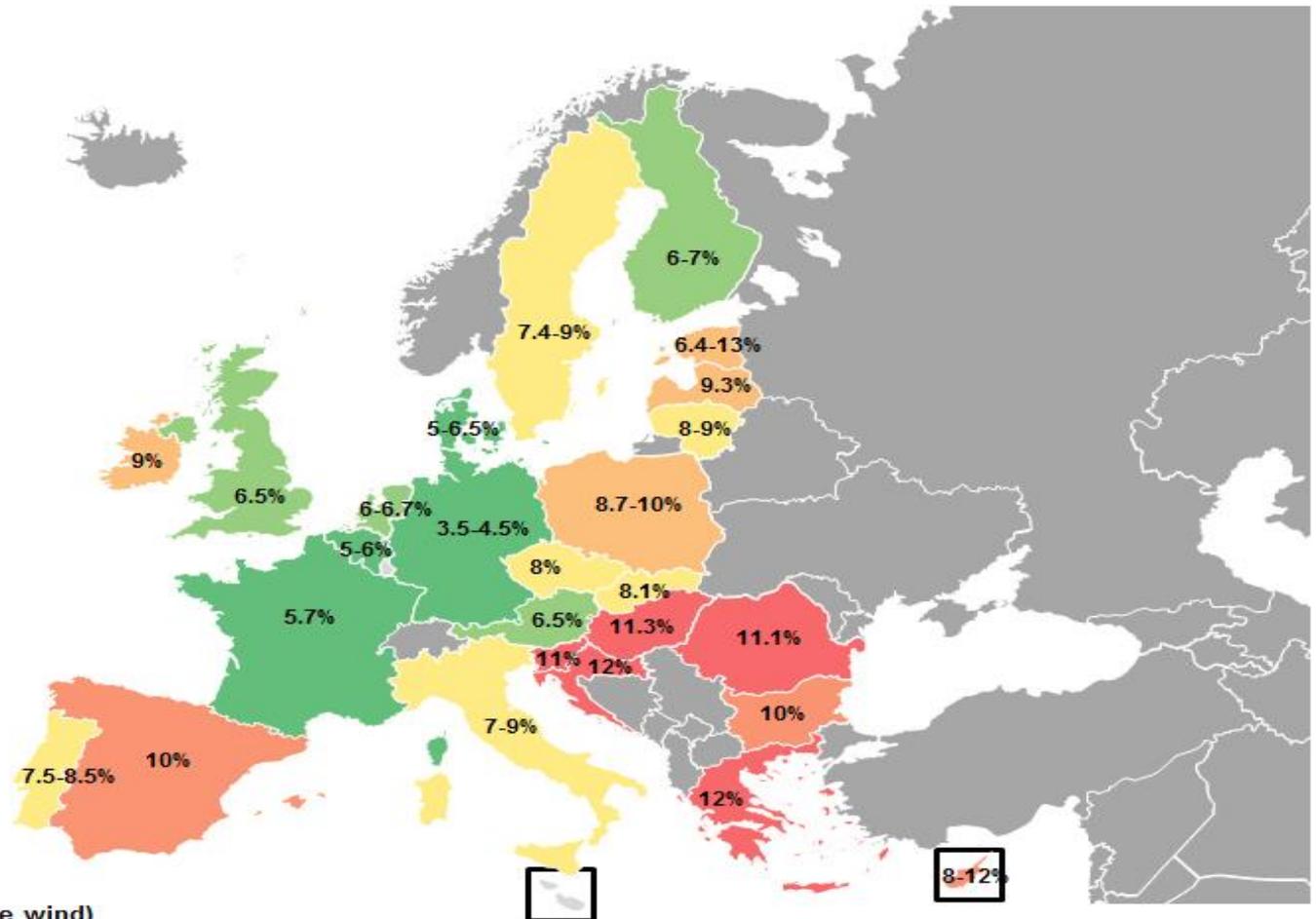
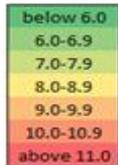
- Market IRR for solar is 7% for long term institutional investors (see next slide)
- At a capital cost of £900k/MWp, a project needs revenue of about £80+/MWhr to be viable
 - Year 1 production typically 1GWhr per MWp in the UK
 - £15k/MWp opex per annum
 - EBITDA => £65k/MWp per annum
 - 9% flat yield
 - -4% for asset amortisation
 - +2.5% for inflation
 - -0.5% degradation
 - Equates (roughly) to 7% yield
- £900k capital cost is:
 - £700k EPC
 - £200k grid + rights
- Conclusion – Solar is not at grid parity in the UK when wholesale power is <£40/MWhr....



RELATIVE COST OF CAPITAL



DiaCore



WACC across the EU-28
(interview results for onshore wind)



EVOLUTION – NEW MODELS POST-SUBSIDY (CONTINUED)

- Solar investors are looking for new ways to survive:
 - Corporate PPAs might be as high as £70/MWhr for B-grade counterparties – anecdotally.....
 - Additional revenue from grid balancing and storage...?
 - Co-generation to use spare grid capacity
 - Co-location with ‘peakers’
 - Squeezing costs, but MIP keeps EPC 10-15% above market (DECC analysis)
- Government remains fundamentally hostile to ground mounted solar
- Grid capacity is difficult to find and expensive
- It’s likely that solar investment will contract dramatically after Q1 2017 with only a small amount of activity, supported by residual rooftop tariffs and small injections of CFD funding
- Even the lowest cost of capital investors are unlikely to invest in risky grid-parity projects



UK SOLAR – WHAT NEXT?

- Concerted push from Government and Industry to find new markets outside the UK, e.g India
- Very little indigenous manufacturing or export capability
- Smart developers moving into real estate (eco-homes) or similar UK domestic businesses
- Not obvious that the skills needed to succeed in the UK translate overseas
- Few large markets in close proximity (Ireland.... ?)
- Industry will shift away from construction and into asset/technical management
- Expectation that solar investment will restart in 2-5 years. Lower costs = less need for subsidy.
- Key factor is investor confidence, which depends on no retroactive adjustments to grandfathered subsidies