

Submission ID: S16694BEA

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Catching The Light

a technical review of East Pye Solar and alternatives



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which replaces

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Catching The Light

Abstract

Within its scope the applicant's measure of alternatives is critically assessed.

In particular it is found that the following do not bear scrutiny:-

- Wind power is inadequately researched, considered and consequently misrepresented - see page 6. This may, and arguably, should be re-examined.
- Consequently the opportunity to examine wind-solar mix hybrid solutions are denied by the applicant. Their merit is explained in page 7.
- By not considering intimately related projects coming to fruition in the immediate location, the potential for increased disturbance to chaotic level on the roads and beyond remains unnoticed, thus unchecked.
- Technicals: National Grid Connection, pages 13 & 14 establishes the proposed linkages to the National Grid are both incoherent and undercooked, for EcoPower Suffolk Solar and TASWAY Energy Park, as well as East Pye, and an imperative all three applicants go back to the drawing board and start again.
- By and large the presence of related schemes extant and in the planning pipeline are ignored. This means any proper measure of alternatives cannot be achieved.

With regards government policy itself the most vital finding is within the Extra-technical section, page 15:-

It is established that the commercial nature of East Pye Solar set against its ultimate co-ownership with National Gas renders it virtually impossible within the world economy for the UK government ever to reach their 2030 net zero target as things stand.

The rest of the report is more positive. Using Sizewell as its starting point it provides a direct alternative to solar alone power stations like East Pye by utilising the opportunities presented by the areas surrounding extant nuclear and gas power station grid infrastructure for wind solar hybrid mixes – pages 16 & 17. This is particularly apt with gas power stations because when the gas is turned off the grid connection will still be there.

After critically examining the 100mw solar threshold planning criterion, pages 18, a regional distribution model utilises the current and well-established local renewable energy sector. By this method the government's solar net zero targets may be far more effectively met. (The Great British Energy Local Power Plan & HMG Warm Homes Plan are relevant policy documents.)

Finally as an instant and effective measure to help achieve net zero a reduction of 10mph on major road speed limits is advocated – we all need to be a little more creative in our thinking.

Author's Notes

If you are a reader who prefers to go from details to more general, may I suggest after the Introduction go to Planning Guidance Issues (pages 10 to 14) before reading elsewhere. If you prefer general to specific read as is.

However if you want to cut to the chase then 5. Extra-technical page 15 is the killer.

To inform this paper the author's background is landscape archaeology and research into the philosophy and history of science and technology. Landscape archaeology provides an understanding of what matters on the ground. Science and technology helps with working through what goes on inside and around the power generation machinery, if not the entire industry.

As a field archaeologist and elsewhere the author had, if peripheral, dealings with the planning process, mainly within the Peak District National Park Authority from 1992 to 2006 – I'm responsible for the clock tower in the centre of Bakewell.

all *italics* the author, who would normally reference to a full academic level; the September 1st deadline has not permitted this but will be done in any written submission before the October 6th deadline.

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Catching The Light Introduction

Task

‘Issue specific hearing relating to site selection, the scope of the proposed development and the draft Development Consent Order (dDCO)’

Method – or scoping the scope

This session is to discuss the application’s scope, whatever that may be.

As well as East Pye Solar’s application itself this method is informed by and rests upon the Planning Inspectorate’s letter 15th July 2026 EN0110014 in its reference to:-

‘Planning Act 2008 – section 88 and 89 and The Infrastructure Planning (Examination Procedure) Rules 2010 – rules 6, 9 and 13’ [page 1]

In general [C1 page 18]:-

‘Regarding national policy, the following National Policy Statements (NPS) have effect, and the issues contained within will be an integral part of the examination:’

In particular:-

Department for Energy Security & Net Zero
Overarching National Policy Statement for Energy (EN-1)

And specifically:-

‘2.3.4 Meeting the Clean Power 2030 Mission objectives necessitates a significant investment in new energy infrastructure, *both large nationally significant developments and smaller-scale developments determined at a local level*. This requirement for new energy infrastructure will present opportunities for the UK and contributes towards the creation of secure, well-paid jobs in the UK’s clean energy industry and building domestic supply chains.’ [page 15]

Starting within its geographical origin, this methodology works outwards, in overall terms, from local, then regional & national, rather than inwards, drilling down ever deeper into minutiae of individual items. (apart from ‘Planning Guidance Issues’ pages 10-14)

In other words more a telescope than a microscope. So working outwards:-

Local

East Pye Solar's Application Itself

EN0110014-000105-6 East Pye Solar Environmental Statement Volume 1 Chapter 5
Reasonable Alternatives and Design Evolution

Wind & BESS

5.1.5 page 5

‘The BESS allows for energy to be released ‘on demand’ at time of greater need, in a way that cannot be provided by wind turbines at this time.’

This is not true. Scottish Power has been doing just this since 2022; i.e. wind and BESS working in tandem.

[‘Whitelee (BESS), co-located at Ardochrig with Whitelee Windfarm.’
<https://www.scottishpowerrenewables.com/bess>]

Wind Turbines – their looks

5.1.4 page 5

‘Onshore wind is not considered to be a suitable alternative because the flat topography of the Order Limits would likely give rise to greater adverse visual effects due to the height of the wind turbines, and the proximity to residential dwellings may give rise to adverse effects associated with shadow flicker and turbine noise.’

The applicant provides no evidence to verify, still less substantiate, that flat topography would give rise to greater adverse visual effects etc.

However a little beyond the applicant's sixteen parishes lies the Eye Wind Farm, operational since 2013, has a maximum tip height of 130 meters yet are just 750 metres and in sight from the Grade II listed Goswold Hall amongst other domestic buildings.

[<https://www.thriverenewables.co.uk/projects/eye-wind-farm>
and <https://heritage.suffolk.gov.uk/Designation/DSF5812>]

The cover photo is Eye Wind Farm Turbines from Eye Castle a mile away rotating in a gentle breeze. (I find them quite soothing, other people don't notice them, which is also good.)

In terms of scale with the David Fine IPR FBFC0B6FD wind farm near, East Pye Solar's footprint - the size of Heathrow Airport - is Brobdingnagian. By comparison a series of wind farms similar to Eye, where virtually all agricultural land remains usable, is more or less the size of toenails of a citizen from Lilliput. Which is more attractive to the eye?

Just around and mainly south of the proposed Great Moulton BESS complex are myriad opportune sites similar to Eye Wind Farm on equally flat land. The inevitable conclusion is wind options should have been and should be considered by the applicant. The fact their expertise may not lie in this field is irrelevant to the force of the argument. The Inspectorate may be of a mind or take advice to request the applicant to reconsider and research wind power generation before going further.

(Not quite an aside, to the best of my knowledge there are no fixed planning guidelines regarding the looks and similar aspects of wind turbine installations.)

Wind Solar Mix or Hybrid Solutions

For wind, solar or hybrid solutions, as well as sun there's plenty enough wind throughout South Norfolk, night as well as day:-

(The Met Office kindly supplied the author with daily data for the last year from Tibenham Airfield. As requested this was given for above 6mph, when wind turbine blades start to turn; above 11mph when they start to reach maximal efficiency. They gave me gust speed too. Highlight figures:-

Gust speeds well exceeded the 11mph threshold every day of the year.

From April to September – the sunnier side of the year – 142 days above 6mph

November to March – windy winters – 156 above 6mph

April to September 45 above 11mph

November to March 74 above 11mph

Therefore just 67 days over the last year with less than 5mph breeze.

Gratitude to the Met Office for these data inside 24 hours.)

For a technical paper which works out ratios between wind and solar for hybrid solutions, please go to 'Design of wind and solar energy supply, to match energy demand.' Mertens S, (2024) Cleaner Engineering and Technology 6 100402

<https://www.sciencedirect.com/science/article/pii/S2666790822000076>

It is definitely worth a read – not too technical if you skip the formulae – and as an appendix I've quoted the abstract in full.

Mertens also states:-

‘Local battery storage of the peak power production is much more expensive as this approximately doubles the energy price (€ per useful kWh according to (Bluesky, 2018)) and cable pooling also cuts the costs for the transport of the energy.’ p7

and

‘Curtailed losses of the baseload mix are thereby shown to be small.’ p1

Going It Alone

If located in north Ecuador, 0 degrees latitude at the equator in the midst of the doldrums photo-voltaics become omnipotent, but we’re in South Norfolk

Instead of considering a hybrid wind-solar mix, East Pye Solar goes it alone with photo-voltaic. They proudly proclaim:-

‘Up to 500 megawatts (MW) of electricity... to power approximately 115,000 homes’

This claim requires unpacking. Is it warranted?

a) Mw & Mwe

Mw or megawatt is a measure of power generated, Mwe is the measure of the amount of electricity as an output reaching the user (Technically we should be billed in kwe hours not kw hours since this is what you pay for. The ‘e’ is a sort-of electrical equivalent of VAT.) With East Pye the ‘e’ is the loss between the panels and the National Grid. Hard to place an exact figure when the proposal gives no technical information, but aside from solar panel tilt motors etc. a loss of 10% in the BESS alone could be expected. Up to 450mwe is a far truer estimate than 500mw, or 103,500 homes not 115,000.

This is not made clear in the East Pye Proposal.

b) Seasonal Variations

‘Up to 500Mw’ is the summer solstice, or for home use 450Mwe.

At the mid-winter solstice, the time of peak demand for heating, due to shorter days and lower suns, the effective power will drop from 450Mwe to around 67.5Mwe or 15,525 homes, or 13.5% of the 115,000 homes East Pye Solar say they will serve.

Where does the remaining 437.5mw to heat our homes come from?

Wind, nuclear but also gas.

With their reliance on gas in winter to deliver ‘the clean power sprint to deliver a clean power energy system by 2030.’ East Pye Solar and at a national level the ninety others needed to meet the government’s stipulated solar targets are running backwards in the wrong direction, even with the Department of Energy and Net Zero’s blessing.

East Pye Solar, Mixed Hybrids and National Policy

In everyday life on the ground, wind-solar hybrid mixes are the better option.

But at the national level of government policy there is an insistence that wind and solar, two renewable and co-related energy forms, ideally made to be hybrid, must inhabit entirely different worlds in ‘the clean power sprint to deliver a clean power energy system by 2030.’ [https://www.gov.uk/government/publications/clean-power-2030-action-plan/clean-power-2030-action-plan-a-new-era-of-clean-electricity-main-report]

These worlds are even further apart than the moons of Jupiter since they at least orbit their parent planet. Weird, bizarre, perverse, irrational, make of it what you will, but nevertheless the arbitrary separation at a policy implementation level of wind from solar ought to be taken into account when the Planning Inspectorate assesses East Pye Solar’s application. Both examining it as a whole, and in particular, Environmental Statement Volume 1 Alternatives against EN-1, EN-3, EN-5.

Wind-solar hybrids ought to be ruled in not out, or at least brought in from the cold.

Planning Guidance Issues

East Pye Solar & EDF BESS

In 2027 EDF's Norwich battery energy storage scheme between Dunston and Swainsthorpe will go on line. This is about half-a-dozen miles north-northwest from East Pye Solar. They do not even mention it in their statement of alternatives, in particular potential locations and most specifically EDF Norwich link to National Grid.

EDF Norwich BESS will feed into the regional distribution network. It will take surplus energy *from* the National Grid, store it up to release when needed to provide power to Norwich and surrounds.

Regardless of short-term contingencies and deficiencies of the National Grid, East Pye Solar will store up energy in their BESS complex to release *into* the National Grid feeding the Norwich area when needed to provide power via the regional distribution network.

So energy will go *up into* the grid only to be taken a few miles *down from* the grid. (To reduce power loss national grid operators attempt to ensure energy travels minimum distances.)

In other words, energy is forced to divert via *c* when it could directly from *a* to *b*. Or in order to walk from the Department of Energy and Net Zero's offices in Whitehall to the Houses of Parliament you have to cross Hungerford Bridge along the Southbank then back again across the Thames at Westminster Bridge.

However since both schemes link to the national grid, there is not even a need to go from *a* to *b*, everything could be placed at *a*. East Pye Solar utterly ignore this option in their alternatives when it is in plain sight on the ground at EDF BESS Norwich. This needs to be addressed.

The fact that EDF and East Pye Solar are separate organisations also held under differing and divergent means of approval is no direct concern of and for the Planning Inspectorate. They have the decision whether or not to approve a scheme for energy generation which is logically incoherent and intrinsically inefficient in delivering the Department's 'Overarching National Policy Statement for Energy'(EN-1).

The Inspectorate may wish to view this section alongside '4. Technicals: National Grid Connection: Norwich-Brampton or Norwich-Tilbury?' page 13 below.

Competing Nationally Significant Infrastructure Projects

Location, Location, Location

Cheek by jowl to East Pye Solar are two further Nationally Significant Infrastructure Energy Projects, each virtually identical in form, nature and seeking planning permission:-

- TASWAY Energy Park – Aukera Energy – immediately west of East Pye Solar
[<https://taswayenergypark.co.uk/>]
- EcoPower Suffolk Solar near Yaxley between Diss and Eye

1. Road Traffic

This means three Heathrow Airport footprints down fifteen miles alongside the A140 – locals are starting to name it ‘solar panel alley’ and if they all get the go-ahead, years of fifteen miles of roadworks, bottlenecks, tailbacks and rat-running around solar park vehicles will make the M25 on a bad day seem like a practise session at Silverstone, never mind the consequent chaos on the adjoining country lanes. (The simple moving single-lane EDF road works entailed several months of up to half-hour delays. Two more complex sets of roadworks operating together will doubtless increase delay due to tailbacks backing onto tailbacks. Since there are potentially three separate companies each rushing to meet completion deadlines there is a low probability they will co-operate to reduce congestion on a Highways Agency designated national route.)

The Inspectorate may take account of this added disturbance and disruption.

2. Precedence

The Planning Act 2008 established the Infrastructure Planning Commission
[<https://www.legislation.gov.uk/ukpga/2008/contents>]

Subsequently it would review separate potential sites amongst its deliberations on a particular application. For example, with Heathrow Terminal 5, Gatwick and Stanstead were clear competitors before the Government went with Heathrow. (In planning terms Courts of Appeal are irrelevant as after the fact.)

If major alternatives well over an hour’s drive on a good day to Terminal 5 were considered, it sets a fair and reasonable precedent that the trio of East Pye Solar, TASWAY Energy Park and EcoPower Suffolk Solar should also be considered together, not geographically separated. They are contained within a rough fifteen by eight mile trapezoid while by comparison, a single national infrastructure project cross-rail aka Elizabeth Line is 71 miles long, while HS2

is well over a hundred, possibly more depending whether fate takes it to Manchester. Unlike Cross-Rail and HS2, these three photo-voltaic schemes are local projects and adjacent on the ground, regardless of their Nationally Significant Infrastructure denotation in Westminster or elsewhere.

3. Speed or pace of completion

- East Pye Solar reckon they won't be on-line till 2031. This means around eight years minimum and after the government's 2030 deadline.
- EcoPower Suffolk Solar reckon 2030 or five-and-a-half years from inception.
- TASWAY Energy Park incept date was 2025 but no end date since the project has been paused.
(Maybe to await the outcome of East Pye Solar but nonetheless it should be factored into the Inspectorate's deliberations as one or both schemes could be approved or rejected, if by different sets of inspectors, and decisions overturned by different secretaries of state.)

Near Diss are two schemes working towards completion:-

- Marsh Lane 4.5 years incept to completion
[<https://www.aurapower.com/projects/marsh-lane>]
- Grange Solar Farm, also 4.5 years incept to completion
[<https://palgrave-pc.gov.uk/solar-farm/grange-solar-farm/>]

As well as ahead of the government's 2030 deadline these initiatives disprove the myth that Nationally Significant Infrastructure Projects in planning terms are speedier than local authority mediated schemes, however hard the Planning Inspectorate drive and are driven to hurry up the process.

After reading this section the Inspectors may consider schemes at the local authority level of planning are a quicker thus more effective way to reach national 2030 targets instead of the current NSIP regime run purely at a national level. In terms of any haste to complete, then East Pye Solar and kindred schemes appear to back-markers if not also-rans.

Though this may not be complete grounds or evidence for refusal, it does inform the current viability of NSIP Solar planning criteria, which is explored further in 'Sizewell C x 62 and Nationally Significant Infrastructure Projects.' page 16

4. Technical National Grid Connection: Norwich-Brampton or Norwich-Tilbury?

The Inspectorate may also take into consideration whether the National Grid, like the A140, which runs alongside, can take the traffic?

Examining these two NSIPs together, East Pye Solar and TASWAY co-exist, separated by the poor old A140. At first it seems overwhelmingly sensible for these two schemes share a single National Grid hook-up onto the existing Norwich to Bramford transmission line. However TASWAY Energy Park and EcoPower Suffolk Solar intend to hook-up onto the proposed Norwich to Tilbury line. In terms of Strategy and Holism, the key overall planning drivers in EN-1 and EN5, it makes total sense to also include National Grid development when examining East Pye Solar and TASWAY. (It also might explain why East Pye Solar mentions, virtually in passing, additional National Grid infrastructure, presumably for an otherwise unnecessary spur onto the proposed Norwich to Tilbury line, ultimately paid for by our energy bills.)

East Pye Solar's 'Environmental Statement Chapter 5 – Reasonable Alternatives and Design Evolution' 5.5.3.

This states:-

‘The Applicant initially considered a Point of Connection (PoC) at the existing Norwich Main Substation; and commenced their search for solar sites in parallel. It was established that there were landowners willing to lease their land for solar development in the area.

‘However, subsequently, NGET advised that there was neither sufficient existing capacity at the Norwich Main Substation nor an opportunity to expand this existing substation to accommodate a 500MW solar project. Given this, the Norwich Main Substation was discounted as a viable PoC.’

This statement will require impartial and independent technical advice, if not already taken.

This is because the statement does not say whether or not the NGET advice included the new National Grid Energy Transmission (NGEC) Norwich to Tilbury scheme due for completion 2031, pending an NSIP planning decision this November 2026.

Norwich Main Substation Mk 2

For the record NGEC state:-

‘Connection Works at Norwich Main Substation

‘5.2.45 Given the nature of the connection works at Norwich Main Substation there is limited scope to vary the size and arrangement of equipment or the colour and finish of materials.

‘5.2.46 The Project connection at Norwich Main Substation is being connected into the approved extension which is currently being constructed (*can viewed looking south from A47 between A11 and A140 junctions*) and does not form part of the scope of this Project. This was approved by South Norfolk Council in September 2024 (planning reference 2024/1336). Therefore, the extent of the Project’s works within the Norwich Main Substation are limited to the population of two feeder bays.

‘These are made up of 400 kV AIS equipment and are to be provided within the live electrical compound being established by third parties, therefore there is no scope to alter the size and layout of this equipment.’

[<https://www.nationalgrid.com/document/564171/download> p.62]

Check or no check that Norwich-Tilbury was included in the advice which National Grid Energy Transmission (NGET) gave the applicant *at the time of asking* need not be questioned for the moment.

However Norwich to Tilbury is a key part of ‘The Great Grid Upgrade - the largest overhaul of the electricity grid in generations’ including transmission of off-shore wind energy from the north sea to the Suffolk coast one side or the other of the River Blyth:-

‘The existing network in East Anglia does not have the capacity to deliver the required amount of electricity to where it is needed. With demand expected to double by 2050, the Norwich to Tilbury upgrade will provide enough electricity to power up to six million homes and businesses.’

[previous ref p.13]

Leaving aside businesses as well as checking the NGEC advice to the applicant, East Pye Solar’s notional 115,000 homes is an additional load of just 2% of Norwich to Tilbury’s capacity. On the face of it, even were the advice-check a tick, the planned Norwich Main Station work by NGET could be adopted and adapted between Island Green Power and the NGET contractors working together for it to become the applicant’s Point of Connection. In Planning Terms neither have gained final approval and may be included within supplementary provisions. In engineering terms it need not have to go on-line until all the other infrastructure elements (transmission pylons etc.) were in place, with an earlier

provision made between the two groups of civil engineering companies plus contractors on the ground to allow for its inclusion – plans are known to get changed, often for good reasons.

Apex Norwich Data Centre

Here's one of them... On the other side of the A140 virtually opposite is the site for the proposed Apex Norwich Data Centre. [<https://www.apexnorwichdatacentre.co.uk/>]
There is previous planning permission for a business park and 150mw energy demand, so Apex plans include a sub-station, which one would think will connect to the improved Norwich Main substation... If this will have the capacity to download an additional 150mw, there is already a potential design modification capability to include an upload from Island Green Power's original and initially preferred location nearby.

In terms of site progress I regularly drive past both sites about two to three times a week. Scarcely noticed any work for months. Seems there's plenty of down-time available to think about things, and a ready source of construction labour and sub-contractors becomes available after the A11/A47 interchange improvements are completed financial year 2028/2029 [<https://nationalhighways.co.uk/roads-and-travel/road-projects/east/a47-thickthorn-junction-near-norwich/>]

Maybe that's what everyone's waiting for

In cost terms Norwich Main Substation Mk 2 seems a cheaper option than a new sub-station at Great Moulton, though it's up to Island Green Power where they spend their money. It would benefit the people of the South Norfolk Claylands immeasurably.

Why say all this?

East Pye Solar also states:-

'It was established that there were landowners willing to lease their land for solar development in the area.'

The conclusion becomes inevitable:-

At Norwich Main Substation Mk 2 there is due to be sufficient grid capacity and potential by 2031 at the time East Pye Solar would otherwise have been completed. Therefore with relatively small modifications to the civil engineering plans and schedule between the two partners - on the ground they are working together on this one: no transmission capacity, nowhere for the energy to go; no energy, nothing to transmit – Island Green Power are able to return to their original intentions.

East Pye is shelved indefinitely to everyone's benefit, but especially those who would otherwise have to live under the East Pye Solar's shadow. (Without knowing quite where Island Green Power originally thought to place the panel arrays, looking at the area by map and foot, it's likely to disturb far less folk, as well as take up less prime agricultural land.)

'It was established that there were landowners willing to lease their land for solar development in the area.'

There is no need to rush. Island Green Power have five years to build on the negotiations with landowners together with the all the technical material and other work completed.

TASWAY Energy Park and EcoPower Suffolk Solar

The reasoning presented here is also equally true for TASWAY Energy Park and EcoPower Suffolk Solar.

The Planning Inspectorate in this particular case are set to examine East Pye Solar alone. If they have not already done so, they may wish to liaise with colleagues examining TASWAY Energy Park and EcoPower Suffolk Solar - the Norwich to Tilbury National Grid upgrade obviates the need for BESS complexes, and this applies equally to all three proposals.

This South Norfolk Claylands scenario may well be in the process of being repeated elsewhere in the UK. The Inspectorate might also wish to raise the matter elsewhere, including confreres working on The Great Grid Upgrade, not least the Norwich -Tilbury team.

Returning to the South Norfolk Claylands, even though Eye Pye Solar, TASWAY Energy Park and EcoPower Suffolk Solar may wish to go it alone, to use very blunt though highly effective phrase, someone somewhere ought to bang some heads together.

5. Extra-technicals

Technically East Pye Solar and similar schemes require hook-up to the National Grid in order to acquire Nationally Significant Infrastructure Status, which in turn requires conformity to the policy document 'Overarching National Policy Statement for Energy' (EN-1) which in turn is why we're here in Dunston Hall.

East Pye Solar is wholly owned by Island Green Power where in turn Macquarie Group are 100% shareholders. Macquarie also entirely owns National Gas, acquiring the final 20% in September 2024, and it is in their and their consortium shareholders' financial interests that it stays in profit regardless of the Department for Energy Security & Net Zero's Overarching National Policy Statement for Energy (EN-1) target to reduce reliance on gas to virtually zero by 2030. (EN-1 2.2.6 p.15) [<https://www.ajbell.co.uk/news/articles/brief-national-grid-completes-ps36-billion-sale-national-gas>]

Whatever else, from this point of view Macquarie and similar consortia are compelled and constrained financially to do their utmost to ensure this net-zero target is never reached. No gas, no gas grid, no money in National Gas.

In conclusion the Planning Inspectorate state they will be guided by national policy statements and in particular in this respect EN-1 Overarching NPS for Energy 2025. This extra-technicals section, summarised in the preceding paragraph, makes an exceptionally strong case that East Pye Solar's application, amongst others, runs directly and irredeemably counter to government net-zero policy which the Inspectorate are guided, virtually bound by. This case may be considered exceptionally strong grounds for refusal, both necessary and sufficient, leaving the Secretary State for Energy and Net Zero to overturn those grounds, should she wish.

Regional & National (or extra-local)

Apart from the wind-solar hybrid mix section (p.7) this report has been entirely negative in that it provides arguments against East Pye Solar and its kin.

It goes against this author's nature. Whenever criticising something I always attempt to provide an alternative which is an improvement, not just different - as with East Pye Solar's 'Environmental Statement Chapter 5 – Reasonable Alternatives and Design Evolution' (Overall their lack of imagination and creativity is almost heart-breaking.)

So let's go for it...

Sizewell C Solar

Outside the locality but about thirty-miles away is Sizewell A, B & C.

Sizewell C's construction site is 338.7 hectares. It is due to be landscaped after construction is complete. Working from East Pye Solar's figures, each hectare covered in solar panels will generate 0.44mw. $338.7\text{ha} = 149\text{mw}$.

Though there's more than enough time within the current project schedule, nevertheless supplementary planning permission would be required to change from landscaping to solar panels - where perceived loss of amenity may be, to use the phrase, mitigated by the cost of landscaping becoming a community wealth fund.

From a technical point of view the photo-voltaic energy could be connected to the Sizewell grid system virtually next door to power the electrics of Sizewell B & C and/or into their grid itself. Relatively speaking it's about as easy as plugging in a kettle to make a cup of tea or adding a spur to a domestic ring main to boil that kettle. By comparison East Pye Solar with its miles of cable corridors, substations and brand new national grid hook-up is wiring an entire office block, or rewiring it while still occupied since the office block is the homes and businesses of the South Norfolk Claylands. The Sizewell solution would require no expensive battery energy storage systems with attendant safety risk.

From Sizewell to Beyond

Though above the latest 100mw NSIP solar threshold, 149mw is no big deal in the grand scheme of things. However if we move from the regional to the national picture, there are 14 other nuclear reactor stations and 48 active major gas power stations, i.e. 62 in all. They all hook up onto the national grid. As well as providing energy to run the nuclear power stations, when the 48 gas power stations are de-activated their national grid hook-ups will remain...

Why not use them to transmit hybrid wind~solar energy or just wind, ideal for transmission, after the gas supply is disconnected and we've bid adieu to National Gas?

It is a simple and elegant solution and since they are at the beginning of any grid supply-chain there is no need for expensive battery energy storage systems while power station sites tend to be in spacey locations distant and isolated from local communities which makes installation easier and less aggravating, ('mitigation' or no mitigation.)

Suppose just half the total 62 stations were utilised?

50% or $32 \times 149\text{mw} = 4,768\text{mw}$ or over nine East Pye Solars

75% fifteen East Pye Solars

100% nearly twenty East Pyes or nine gigawatts.

The Government's 2030 total solar energy target is 45 to 47 gigawatts.

[<https://commonslibrary.parliament.uk/research-briefings/cbp-7434/>]

Sizewell C times 62 will generate 9 gigawatts or $1/5^{\text{th}}$ of this government's target.

Sizewell C Solar x 62 and Nationally Significant Infrastructure Projects

A cautious or reluctant inspector may not consider moving beyond the physical boundaries of East Pye Solar, even though the National Grid, part of its *raison d'être* does.

Reasons to do so have already have already been addressed in Planning Guidance Issues (p10 - 14) However in terms of infrastructure Sizewell C x 62 is truly an Nationally Significant Infrastructure Project: nine gigawatts potential is both national and significant. Sizewell C itself is rated at 3.2gw. In terms of energy renewal it is focused entirely and contained within the existing infrastructure. The fact that there are 62 different sites is exactly the same as 62 different termini on a single rail network.

The 100mw Threshold Criterion

A great fault of the current NSIP framework for solar energy is the threshold of 100mw rather than the criterion that an application must demonstrate its technical efficiency and effectiveness within a sector of the regional distribution network. It has to be regional distribution as the intrinsically fractional energy outputs of photo-voltaic components render them fundamentally unsuitable for national transmission – that’s why they need battery energy storage systems.

A secondary criterion is the applicant must research and take into account other schemes whatever their planning status. This would allow a scheme to be properly decided as one even though it crossed two or more local authority boundaries.

As it stands the 100mw threshold gives licence for individual schemes like East Pye Solar without any reference whatsoever to others and vice-versa.

It mirrors and mimics the 19th century railway boom where individual line proposals required individual acts of parliament without any idea of network. The result was and is an inefficient system where individual lines aren’t where or what they might be. For example had the Marylebone to Birmingham line been built to the same standards as the Euston to Birmingham line then HS-2 stage 1 would be unnecessary: the capacity would be there.

Perhaps 19th century railways are a journey too far. However it does relate to the technical aspects of the government’s solar energy strategy as a whole. East Pye Solar requiring an additional sub-station at Great Moulton and suggesting spurs or ‘railway sidings’ to transmission lines not yet built just delays the National Grid becoming fit for purpose.

Regional Distribution – a model

Within a solar energy strategy *modus operandi* it's far better for photo-voltaic to be geared to the regional distribution network. Let's work out an example.

As said immediately above, photo-voltaic is better placed to latch onto the regional distribution network (and therefore not the national grid transmission network)

.... the scaffolders will want their cups of tea as a first stage of 17 solar panels installed on our roof. Excess electricity will be fed back into the regional distribution network. No one intends to cable our home onto the National Grid at Great Moulton just two miles down the road, yet in their own small way those 17 solar panels reduce load and improve resilience of the National Grid. This national potential of the regional distribution network is now examined.

The figures:-

- 250,000 hectares of south facing commercial and industrial rooftops
[<https://www.cpreherts.org.uk/news/over-1-5-billion-sq-ft-of-industrial-rooftops-available-for-solar-in-uk/>]
- 230,000 to 290,000 hectares of actual sloped roof surface area of domestic dwellings
[sources various]

Calculations

1. Halve the domestic dwellings figure to equate to south-facing = 115 to 145,000 hectares; average = 130,000 hectares
2. Average commercial and industrial = 260,000 hectares
3. Add average commercial and industrial to domestic = 390,000 hectares
4. Assume just a quarter of area exploited for photo-voltaic = 97,500 hectares
5. 97,500 hectares @ 0.44mw per hectare = 42,900mw
6. With East Pye Solar rated at 500mw, it means around 85 East Pyes

Discussion

A quarter is a very big ask though it equates to the sum the government wants from East Pye Solar and its ilk. It's also not such a big ask if wind generation is factored in for suitable rural areas.

To see if it's functional and how, I've already touched base with my local distribution company (who also are working on Sizewell C) and solar roof panel companies.

On the face of it the model is worth some thought, (though transforming our 0.008245mw into something rather larger could lead to a national shortage of teabags and hobnobs!)

From the East Pye Solar inspectors' point of view, mindful of the effective delivery of (EN-1) they may suggest further research into this area, to include revisiting:-

Great British Energy Local Power Plan [<https://www.gbe.gov.uk/local-power-plan>]

and

HMG Warm Homes Plan

[<https://www.gov.uk/government/publications/warm-homes-plan/warm-homes-plan-html>]

Additional Advantages

A Regional Distribution Model possesses additional advantages:-

Labour Market, Job Creation and Careers

Planning Inspectors may also consider within their decision-making that further investigation is required into areas such as scarcity of labour in the construction market: East Pye Solar, for instance, will be competing with the building trade to hit the government's ambitious housing targets, where there is already a shortfall of workers. It's not just the hobnobs which will run out, the limited and finite supply of appropriate labour would delay both projects. On the other hand the regional distribution model integrates the construction labour market – solar panels are already part of new house builds. It also genuinely creates employment, training, business and career opportunities. Once an East Pye Solar were finished, its construction teams will be out of work.

Enlarging not Reducing the UK Carbon Footprint

Another area to investigate is the relative increase in global carbon emissions in construction between localised distribution networks – which should be negligible – compared to East Pye Solar schemes with thousands of cubic yards of concrete, heavy vehicle and plant fuel, and beyond these shores the excavation, processing, transport and construction of the unnecessary lithium-ion batteries. While returning to the South Norfolk Claylands, consideration must also be made of the CO₂ absorption loss through removal of field upon fields of photo-synthetic carbon capture. Even before they produce a watt of power, the East Pye Solars of this world will have added a corn, callous or maybe a bunion to the nation's carbon footprint.

Speed Limits

If only to encourage the Department of Energy and Net Zero and Department of Transport to have a positive discussion, a really simple means to work towards the 2030 net zero target is reduce the speed limits by 10mph on motorways, dual-carriageways and single-carriageways. Motor vehicles use energy, be it electricity or fossil fuel, and the 10mph reduction will significantly reduce carbon emissions. You could say this was a nationally significant infrastructure project too, although the only infrastructure alterations required are the amendment of some speed limit signs and recalibration of speed cameras.

This is not the time nor place to rehearse arguments (petrol-heads won't like it, but the accident rates and seriousness will fall and levels of vehicle pollution drop too) All the same the Inspectorate may wish in their findings to allow the concept credence. It may foster a more creative and imaginative approach at the national level too.

Conclusion

Results

When all is said and done, regardless of BESS safety issues and what it will do to the lives of people who have no direct democratic means to help determine any outcome, it is demonstrable that technically East Pye Solar is at best merely a short term fix to a long term problem already being solved, namely the inadequacy of the national grid. Although it will generate 500 megawatts, it will do little to reduce our reliance on gas, especially in winter.

Together with neighbourhood proposals, EcoPower Suffolk Solar and TASWAY Energy Park, the Norwich-Tilbury National Grid improvement due in 2031 will remove any need for BESS complexes.

From this purely technical analysis the commercial ownership of East Pye Solar was examined and established that due to its co-ownership with National Gas it could never in the world of financial markets help the UK Government to achieve its Net Zero 2030 targets.

Probably the reverse.

It will be exceptionally hard, not to say tricky, to undo those HMG decisions which have led to this situation, and clearly beyond the Inspectorate's remit to determine. They may advise.

However the very nature of nationally significant infrastructure projects is examined, not least by using an example of a model based on the reuse of the Sizewell C construction site, extended to other power station locations to produce comparable energy into the national grid for far less expenditure, social upheaval and environmental damage.

An alternative solution to help hit the 2030 net zero target using the regional distribution network - with or without a wind-solar mix hybrid – has been explored. It also has the added bonus of lessening the load on the national grid, in turn making it more resilient.

Against this the Department of Energy and Net Zero's work in Westminster splits wind and solar in two, and never the twain shall meet. The 100mw NSIP solar threshold criterion may be discarded. Instead a better and more congruent model is to use regional distribution network as a basis for facilitating schemes at both local authority and national infrastructure level working together, not apart.

Last but by no means least, the big net zero picture is completed by suggesting a reduction of speed limits to lessen the immediate need for fossil energy, be it gas, petrol or derv. To create a better world we need to be creative in our thinking.

Outcomes

If East Pye Solar planning process points to anywhere it is for a rethink how to best realise the government climate change targets in operational terms. Here the 100mw threshold for NSIP Solars is found to be unfit for purpose.

A more integrated regional distribution parameter-set seems more suitable, especially for local situations where three NSIP Solars jostle for position in the Great South Claylands Net Zero Steeplechase between Eye and Dunston Hall.

There is an immense lacunae between the intentions in Westminster and their effect on the ground, which without irony is too often the very opposite to those intentions. This gap needs to be bridged.

Whether it is or not depends in a significant part upon how schemes such as the East Pye Solar application are determined.

Thank you for your attention.

Appendix ‘Design of wind and solar energy supply, to match energy demand.’

Mertens S, (2024) Cleaner Engineering and Technology 6 100402 *italics Fine D*

Renewable energy sources have an intermittent character that does not necessarily match energy demand. Such imbalances tend to increase system cost as they require mitigation measures and this is undesirable when available resources should be focused on increasing renewable energy supply. Matching supply and demand should therefore be inherent to early stages of system design, to avoid mismatch costs to the greatest extent possible and we need guidelines for that. This paper delivers such guidelines by exploring design of hybrid wind and solar energy and unusual large solar installation angles.

The hybrid wind and solar energy supply and energy demand is studied with an analytical analysis of average monthly energy yields in The Netherlands, Spain and *Britain*, capacity factor statistics and a dynamic energy supply simulation. The analytical focus in this paper differs from that found in literature, where analyses entirely rely on simulations. Additionally, the seasonal energy yield profile of solar energy at large installation angles is studied with the web application PVGIS and an hourly simulation of the energy yield, based on the Perez model.

In Europe, the energy yield of solar PV peaks during the summer months and the energy yield of wind turbines is highest during the winter months.

As a consequence, three basic hybrid supply profiles, based on three different mix ratios of wind to solar PV, can be differentiated: a heating profile with high monthly energy yield during the winter months, a flat or baseload profile and a cooling profile with high monthly energy yield during the summer months. It is shown that the baseload profile in The Netherlands is achieved at a ratio of wind to solar energy yield and power of respectively $E_w/E_s = 1.7$ and $P_w/P_s = 0.6$.

The baseload ratio for Spain and Britain is comparable because of similar seasonal weather patterns, so that this baseload ratio is likely comparable for other European countries too.

In addition to the seasonal benefits, the hybrid mix is also ideal for the short-term as wind and solar PV adds up to a total that has fewer energy supply flaws and peaks than with each energy source individually and it is shown that they are seldom (3%) both at rated power. This allows them to share one cable, allowing “cable pooling”, with curtailment to -for example- manage cable capacity.

A dynamic simulation with the baseload mix supply and a flat demand reveals that a 100% and 75% yearly energy match cause a curtailment loss of respectively 6% and 1%. *Curtailment losses of the baseload mix are thereby shown to be small.* Tuning of the energy supply of solar panels separately is also possible. Compared to standard 40° slope in The Netherlands, facade panels have smaller yield during the summer months, but almost equal yield during the rest of the year, so that the total yield adds up to 72% of standard 40° slope panels. Additionally, an hourly energy yield simulation reveals that: facade (90°) and 60° slope panels with an inverter rated at respectively 50% and 65% Wp, produce 95% of the maximum energy yield at that slope. The flatter seasonal yield profile of “largeslope panels” together with decreased peak power fits Dutch demand and grid capacity more effectively.’

[E_w is wind energy; P_w is solar energy; E_p is wind power; S_p is solar power.]

Figs 8 & 9 indicate graphically how co-located wind solar hybrids perform better to match seasonal energy production to seasonal power demand than wind or solar alone.