

Daniel Kenning

Chartered Energy Engineer

Splendid Engineering

Produced by

the energyst

Supported by

e-on

What is needed beyond ESOS?

Examples of ESOS recommendations

Limitations of ESOS

Foreseeable future operating environment

Opportunities beyond ESOS

Transition Engineering route to future prosperity

ESOS example 1

	Description of Energy Saving Opportunity (ESO)	% saving	% saving vs total	Capital cost £	Energy saving per annum kWh	Cost saving per annum £	Simple Payback years
1	Set Points - heating and cooling	8.00% (gas)	5.60%	£5,000	84,518	£3,245.51	0.65
2	Doors and Windows - avoiding heat loss	5.00% (gas)	3.50%	£15,000	52,824	£2,683.13	5.59
3	Procurement of efficient small appliances	5.00% (elect)	1.41%	£10,000	21,223	£3,244.16	3.08
4	Monitoring and Targeting	5.00% (all)	5.00%	£15,000	75,506.47	£6,103.84	2.46
5	Half-Hourly Metering	7.50% (elect)	2.05%	£4,800	30,961.52	£4,727.90	1.02
	TOTAL	17.55%			265,034	£20,004.53	

ESOS example 2

ESO	Description	Capital investment £	& saving	Modelled Cost saving per annum £	Energy saving kWh	Payback (years)
1	HVAC - Set Points - heating and cooling	0.00 nil	8.00% (elect)	7,347.68	57,378	0.00 immediate
2	Monitoring and Targeting	10,000.00	5.00%	8,110.84	77,889.37	1.23
3	Half-Hourly Metering	11,800.00	7.50%	12,166.25	116,834.05	0.97
4	Sub-Metering	18,100.00	5.00%	8,110.84	77,889.37	2.23
	Lift optimisation software	1,500.00	0.65%	632.00	10,179.00	2.37
	TOTAL		21.84%	36,367.61	340,169.79	

ESOS example 3

ESO	Description	Capital investment £	% saving	Modelled Cost saving per annum £	Energy saving kWh	Payback (years)
1	Changes to Company Car Policy	10,360 to 21,300	2.0-5.0%	4,837 to 18,230	11,224 to 31,088	Between 2.0 - 8.0
2	Turn off equipment when not in use	5,000	0.4%	446	2,739	Between 0.0 - 23
3	LED lighting upgrade	3,600	1.2%	1,042	6,949	3.5
4	Half-Hourly Metering	6,600	4.0-9.0%	7,811	53,763	Between 1.0 - 2.0
5	Monitoring and Targeting	0.00	4.5%	3,905	26,884	0.0
	TOTAL		17 %		102,000	4.59

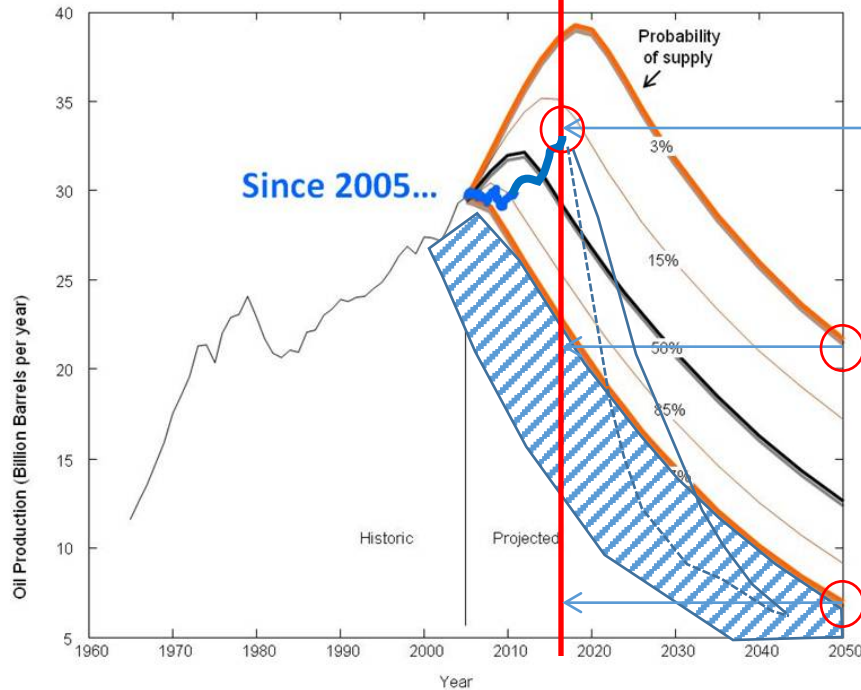
Limitations of ESOS

- “BAU + Incremental change”
- Focus on easiest changes first!
- Outcomes small versus other influences on business
- Outcomes do not ensure sustainability
- Compliance with policy, not with operating environment

- MORE CHANGE IS NEEDED....
to secure prosperity in the foreseeable future

Forward Operating Environment – and safe operating space

World Oil Supply
Historic Data and Projected Supply Probability Assessment



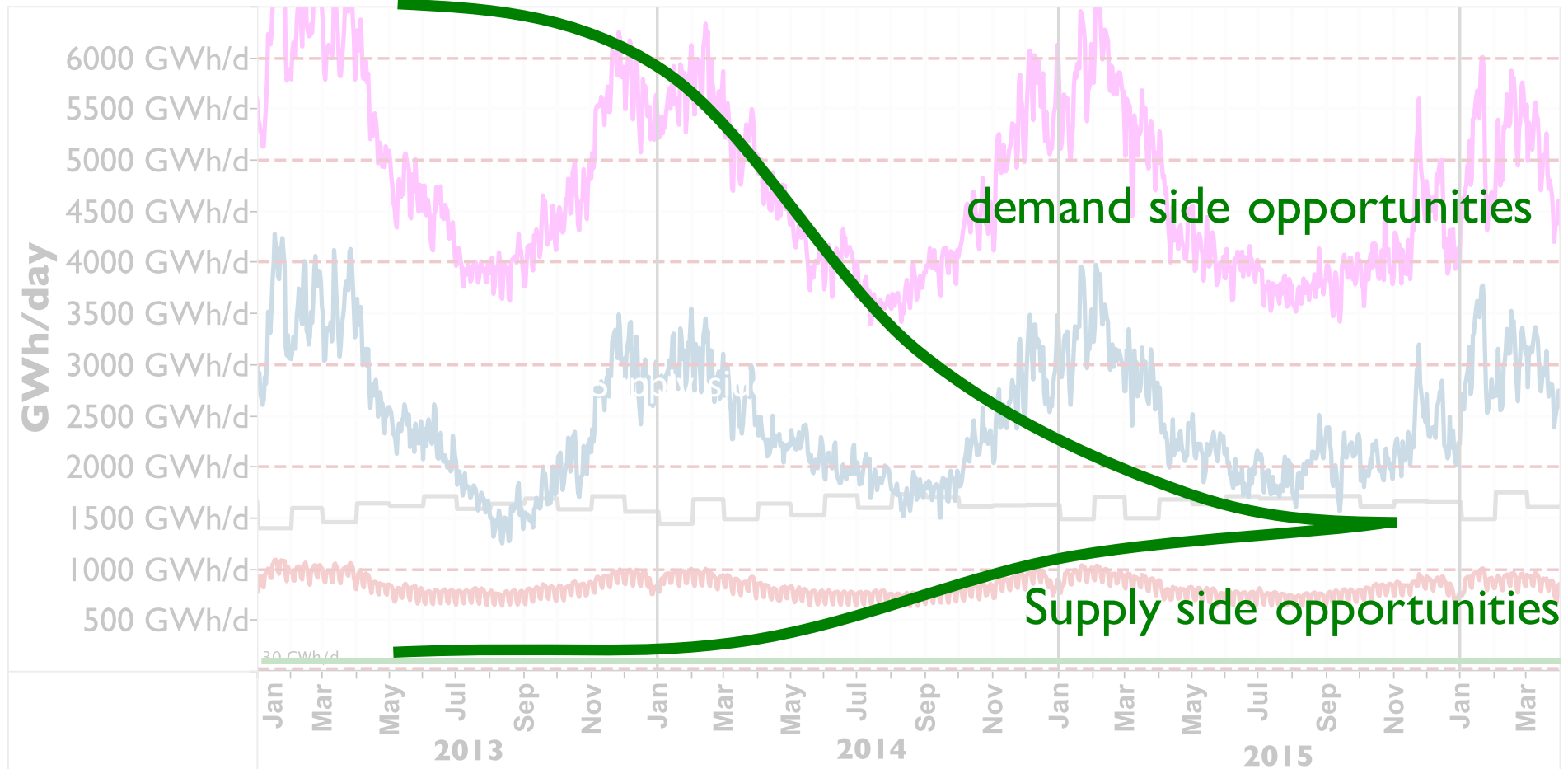
Current scenario
34.85 bb/d

Future constraint; most optimistic
~21 bb/d (-40%)

Future constraint; most probable
~7 bb/d (-80%)

Source: Krumdieck, S., Page, S., & Dantas, A. (2010). Urban form and long-term fuel supply decline: A method to investigate the peak oil risks to essential activities. *Transportation Research Part A: Policy and Practice*, 44(5), 306-322.

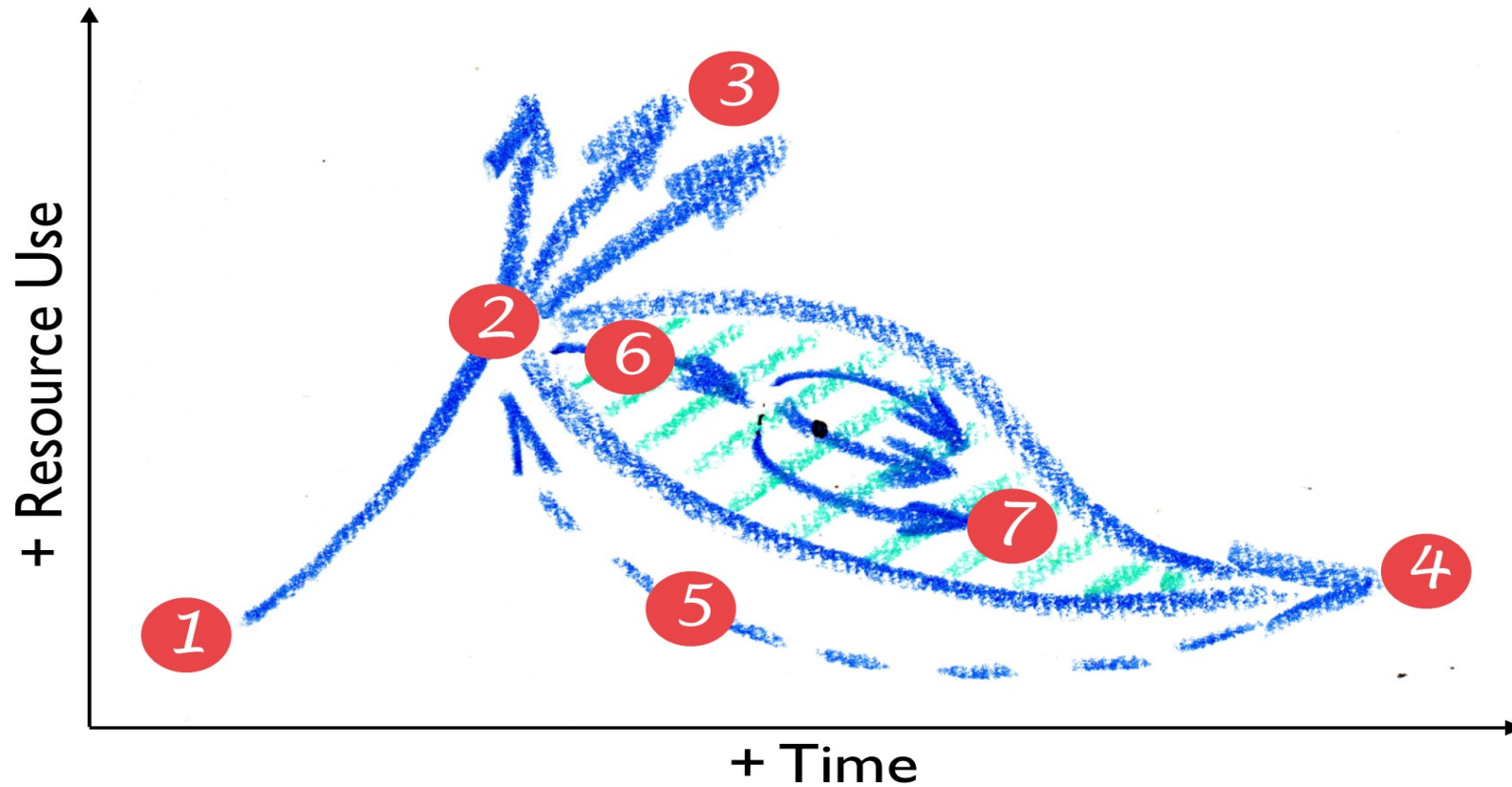
Great Britain's Energy Vectors – in GWh per day



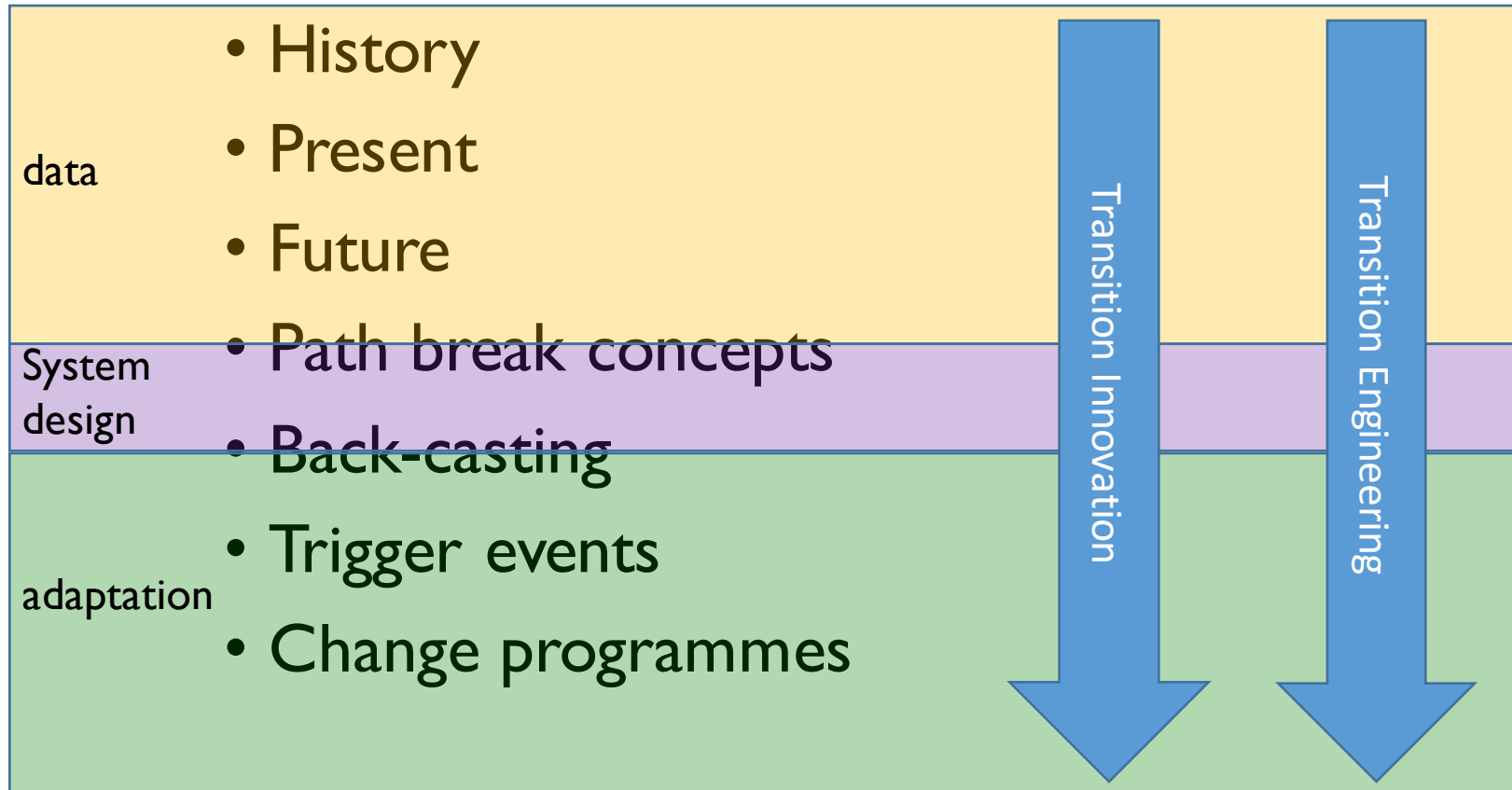
Underlying data are publicly available from National Grid and Elexon websites.
Charts are licensed under an Attribution-NoDerivatives 4.0 International
based on paper <http://journal.frontiersin.org/article/10.3389/fenrg.2016.00033/full>
grant.wilson@sheffield.ac.uk



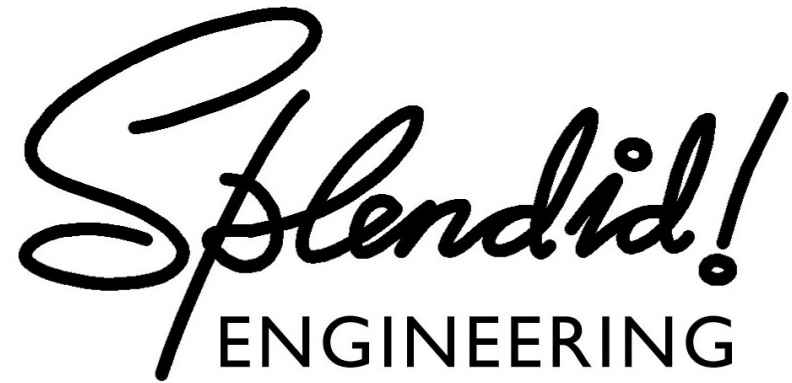
Transition Engineering - model



Transition Engineering - steps



Ask me how it works for you...



towards better

www.splendidengineering.co.uk

Daniel Kenning

01245 206 555 / 07813 773 404