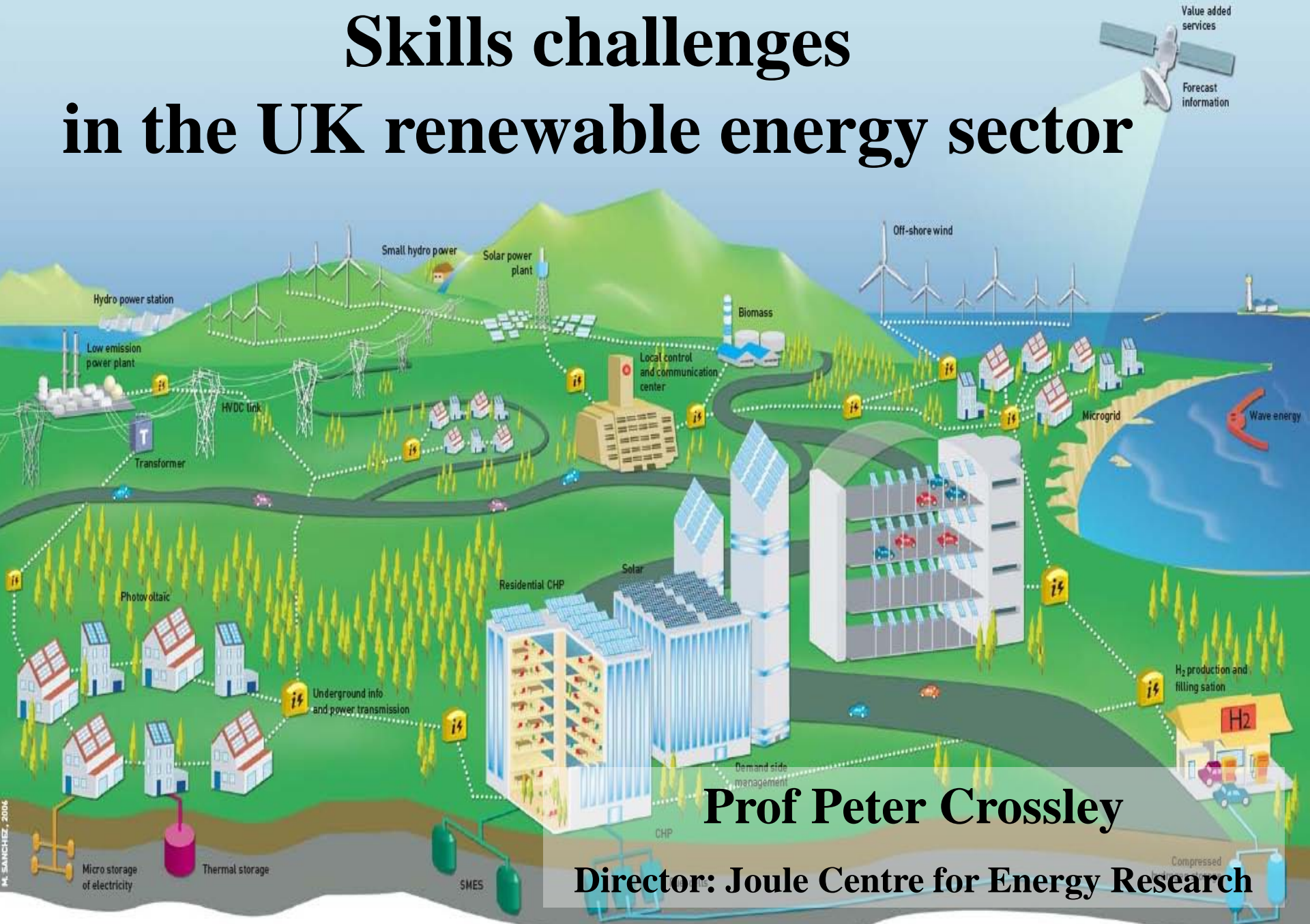


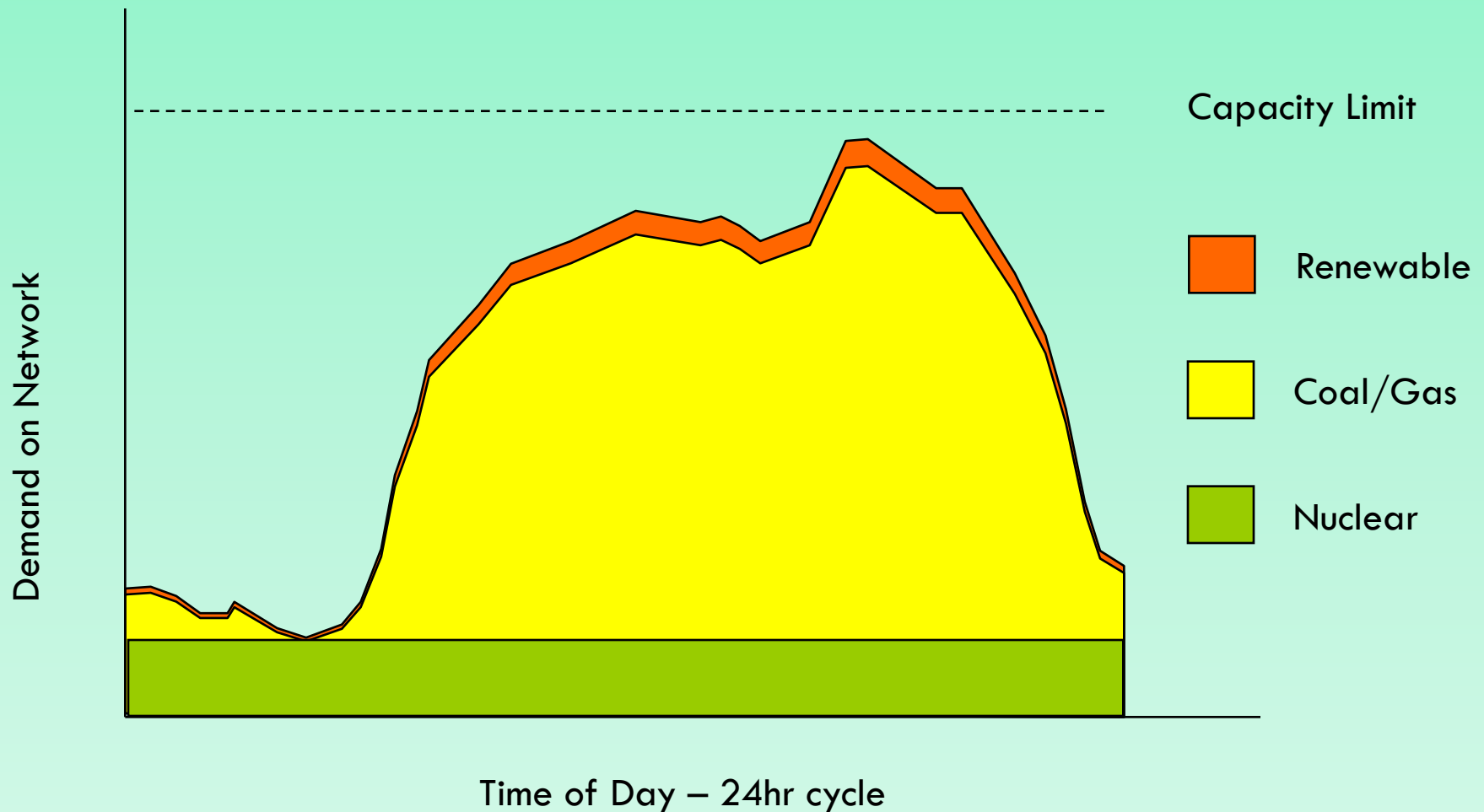
Skills challenges in the UK renewable energy sector



Prof Peter Crossley

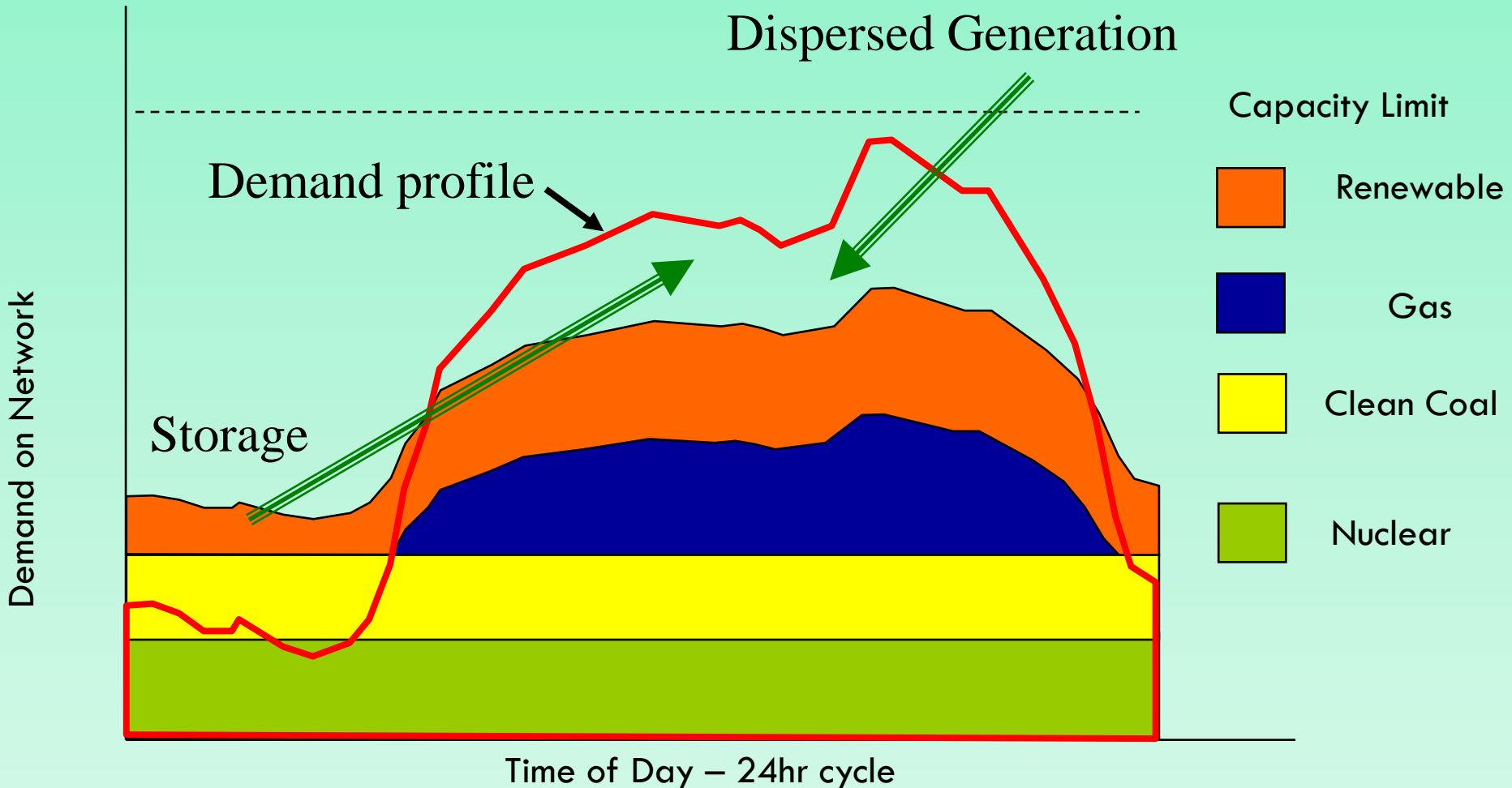
Director: Joule Centre for Energy Research

What supplies our energy today



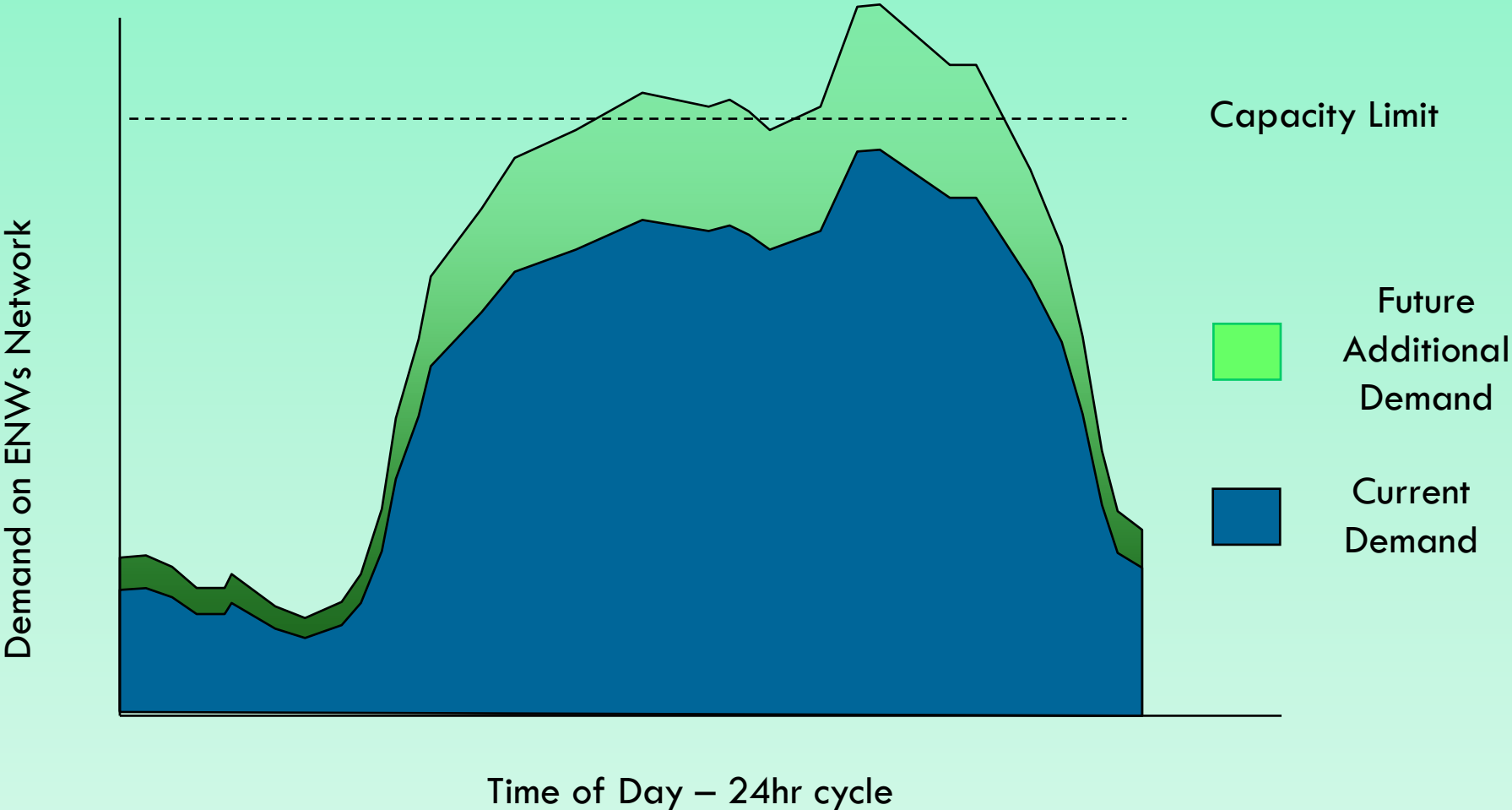
Existing demand supplied from coal, gas, nuclear, renewable generation

How do we ensure the lights stay on in 2030



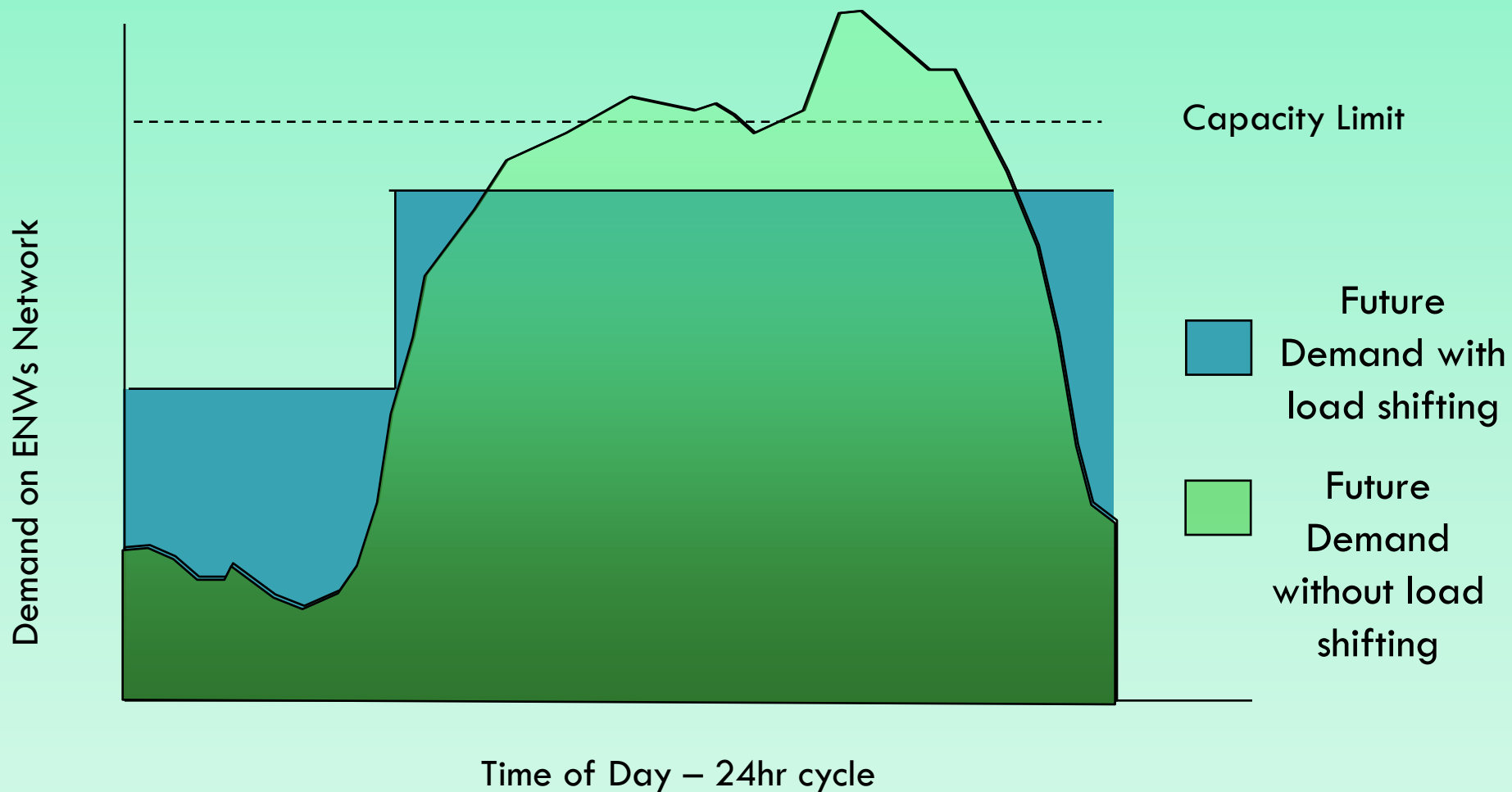
Can renewables, clean coal, gas, nuclear, storage & dispersed generation deliver the energy when we require it, at a cost we can afford ?

Demand > local network capacity?



Growth in demand due to electric vehicles and domestic electric heating

Dynamic Demand, Storage & Dispersed Generation required to lower demand below capacity



Can we shift demand from times of peak energy to periods of low use?
or can we match demand to availability of low cost energy

- Tackle worklessness by linking people, jobs and training.
- Increase participation of 16-19 year olds in education and/or work based learning, thereby securing increases in Level 2 and Level 3 attainment and progression into higher education.
- Increase the proportion of adults with the skills & qualifications needed for employment in the key sectors (including energy).
- Stimulate employers to invest more in workforce development which meets business needs (including innovation, management, leadership and technical & professional skills).
- Stimulate demand from individuals for entrepreneurial, intermediate and higher level skills.
- Support providers to respond to the needs of individuals and employers through delivery of high quality training.

Low Carbon Skills:- Key Challenges

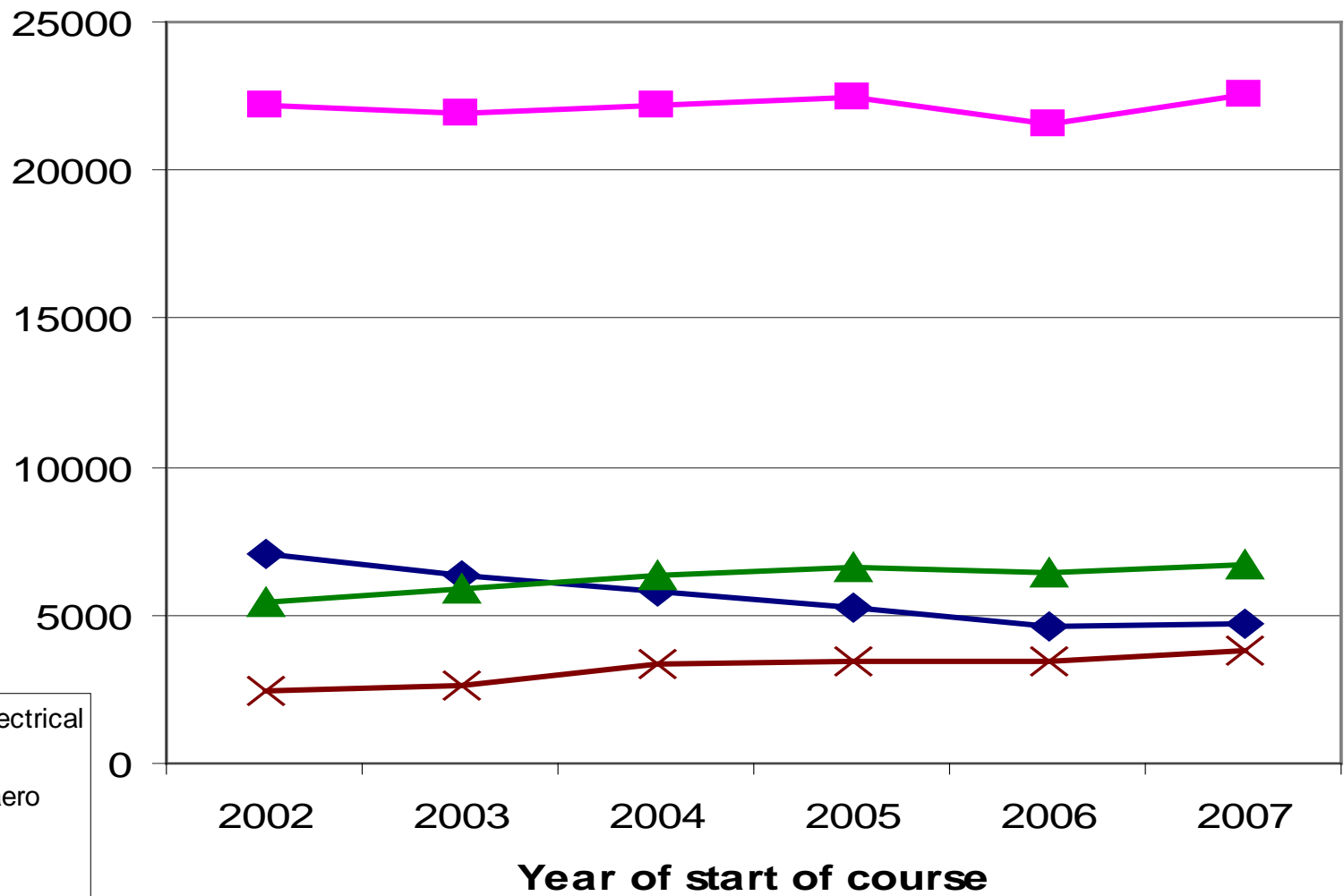
- Deliver significantly higher volumes of STEM (Science, Technology, Engineering & Maths) skills at all levels.
- Develop and deliver the specialist skills needed for emerging sectors & technologies.
- Get more people interested in low carbon careers, skills & qualifications.
- Stimulate employer demand for investment in low carbon skills
- Replicate good practise in each of the above

Challenges for the Power Industry

- Ageing of the current workforce: 80% of power industry workforce will retire by 2024.
- Industry will need >28,000 skilled employees.
- Significant new build of nuclear power stations, off-shore wind farms, coal with CCS and smart electrical networks.
- Skills required to deliver & operate new generation, transmission, distribution & energy utilisation technologies.
- Need to recruit large numbers of apprentices & graduates with STEM skills.

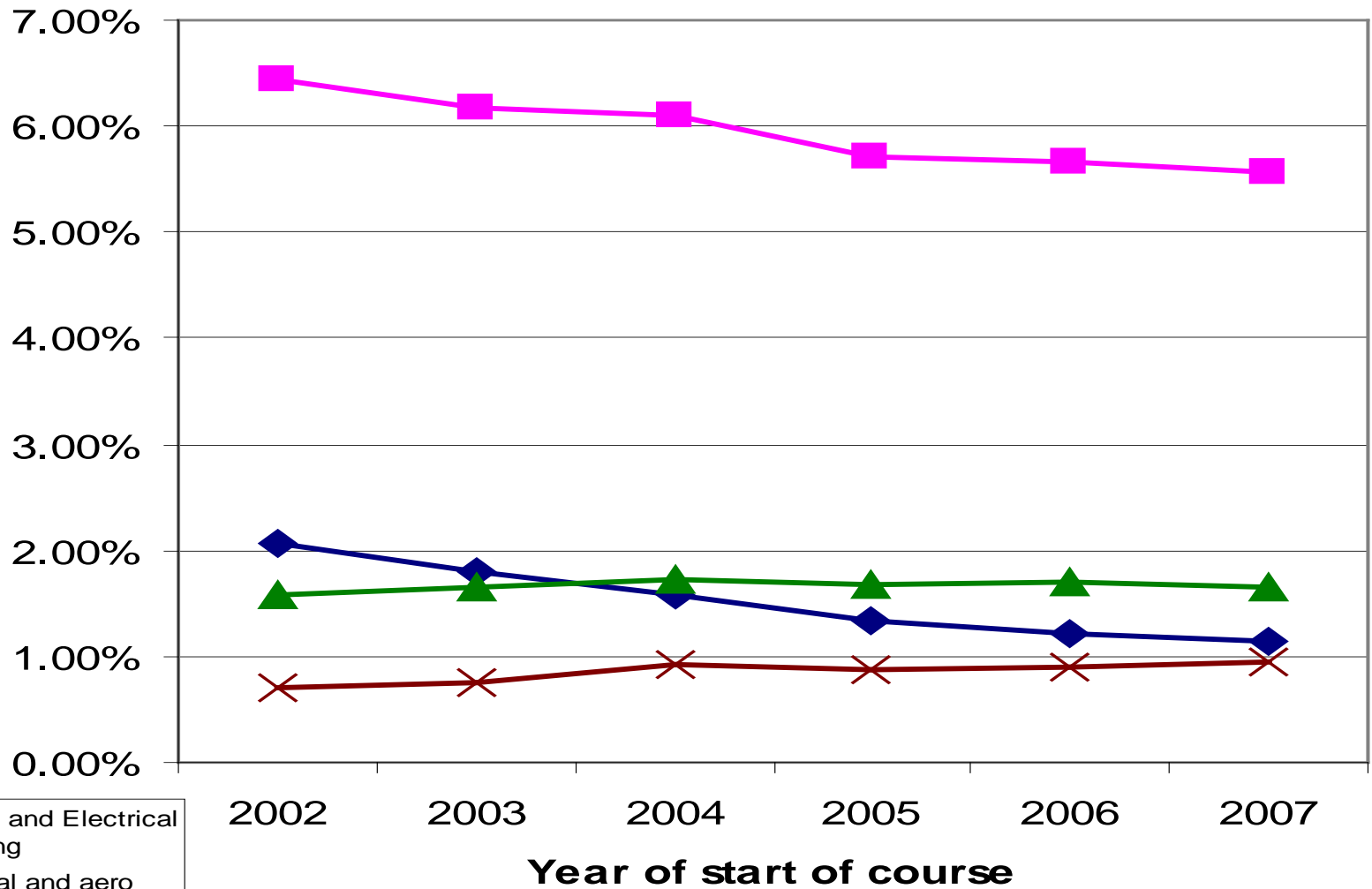
- DECC has supported National Skills Academies for Nuclear and Power
- Wind & nuclear energy requires technician level skills (Government will co-fund advanced apprenticeships)
- Power Academy: funded by industry, to encourage the best EEE graduates into the power sector

Engineering at Universities: student numbers



- ◆ Electronic and Electrical Engineering
- ▲ Mechanical and aero engineering
- × Civil Engineering
- Engineering as a whole

Engineering at UK HEI: % of all students



- ◆ Electronic and Electrical Engineering
- ▲ Mechanical and aero engineering
- × Civil Engineering
- Engineering as a whole

Conclusions of House of Commons report on:- Future of UK electricity network

- Transition to a low-carbon economy requires trained people with the skills to resolve the challenges networks face.
- Aging workforce and lack of new recruits mean the industry currently faces an acute skills shortage.
- Welcome the establishment of the National Skills Academy for Power, but need to do more to inspire young people & graduates into the energy sector.
- Network companies should face improved incentives through the price control reviews.
- Companies must accept their role in ensuring employees have the opportunity to improve their skills
- A skilled workforce will be crucial to the development of a cost-effective low-carbon energy system.

- Address the challenge of 80% of the workforce retiring or leaving the industry in the next 15 years
- Support the development of a seven-fold increase in skills needed to deliver the 45GW of renewable generation capacity
- Deliver a new skilled workforce to re-new our coal and gas-fired power stations as well as transmission and distribution systems
- Develop partnerships to ensure the delivery of the skills required to enable the deployment of smart meters and smart grids
- Enable the industry to meet ambitious government plans to maintain the security of the UK's power supply, meet low-carbon generation targets and to provide affordable energy
- Position the UK Power Sector workforce as a world leader in the renewable & low carbon energy sector

- **Energy & Utility Skills:**
 - Tailored undergraduate programmes
 - Transitional & advanced specialist Masters programmes
 - Short Courses for existing professionals and community development courses
- **Summit Skills:**
 - Solar water and heating, photovoltaics and micro-generation, micro wind energy, ground/water/air source heat pumps, biomass, biofuels, micro hydro generation, combined heat & power, upgrading existing systems, heat recovery, low energy lighting, smart metering.
- **Asset Skills:**
 - Energy and sustainable competencies
 - Energy efficiency inspection and certification
 - Short courses targeted at existing professionals

IET Power Academy

- Power Academy founded in 2004
- “To address ... the shortfall in engineering expertise in the electricity power industry by attracting new talent into the industry.”



- Power Academy attracts students onto Power Engineering courses with a mix of financial incentives, technical training and business education.
- In the first 4 years, over 250 scholarships awarded.

Conclusions

- In the current financial climate there's a challenge to persuade industry to invest in skills and R&D
- There's more to the Skills Agenda than just providing training
- Necessary to improve industry - university engagement
- Need for higher skills but shortages don't appear to be well defined and entrepreneurial skills don't appear to feature
- New training requirements will create an opportunity for responsive training providers
- Creating & maintaining sufficient graduates, trainees, apprentices along the entire skills supply chain is critical for our energy future