Committee Secretary
Select Committee on Fair Dinkum Power
Department of the Senate
PO Box 6100
Parliament House
Canberra ACT 2600

Dear Secretary

Not fair dinkum, more like unfair bunkum

The Australian Alliance for Energy Productivity (A2EP) is an independent, non-partisan, not-for profit coalition of business, government and research leaders promoting a more energy productive economy. Thanks for this opportunity to contribute to your consideration of a range of issues associated with electricity production and consumption. Our work over the last decade has focused on the demand-side of electricity markets and the role that consumers could play if these markets were genuinely consumer-centred.

A2EP has long advocated that a positive approach to energy productivity, as an integral and central part of the national energy/carbon strategy, ensures there need be no energy trilemma but, instead, a trifecta. We can have energy for homes, commerce, industry and government that is reliable, affordable and sustainable, and delivers more value. There is no inherent conflict in delivering these objectives simultaneously and harmoniously. The trifecta relies on:

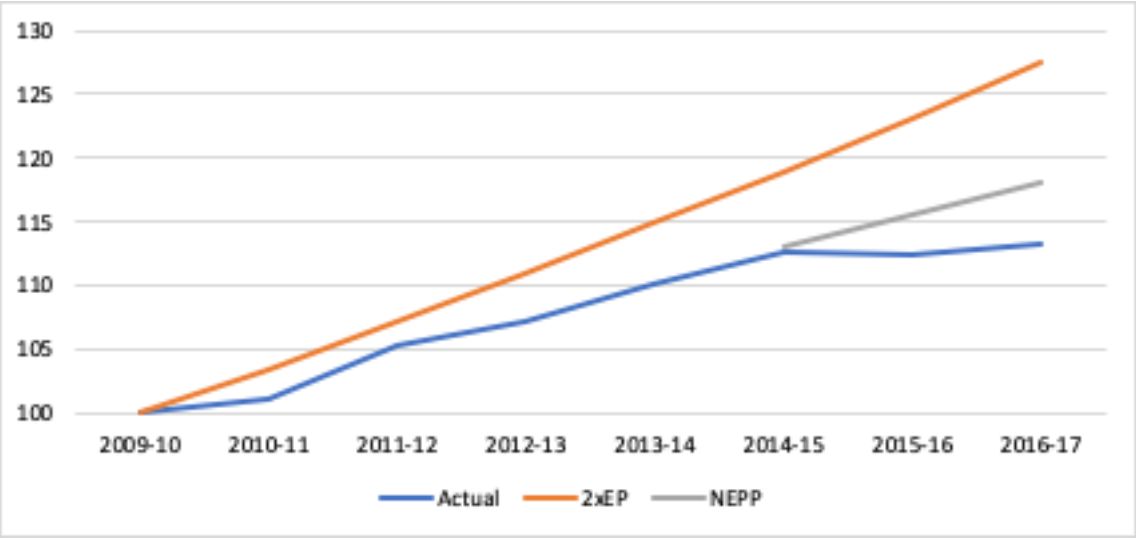
- using energy more effectively and efficiently, and
- at times when it is cheaper to supply from the grid.

Energy productivity improvement is the element that allows systems transformation and carbon mitigation to be achieved simultaneously, economically and harmoniously. Every model without energy efficiency at its centre fails one of the three trifecta tests. The Germans learned this from experience and realised that they needed to refocus their 'Energiewende' energy plan with energy efficiency as the centrepiece rather than renewable generation, in order to enable the promised transition. Australia needs its own version of the German vision, with energy productivity at its core.

A2EP proposed a doubling of energy productivity by 2030 (2xEP), from a 2010 baseline. That goal was ambitious, but our business coalition regarded this rate of improvement essential to manage

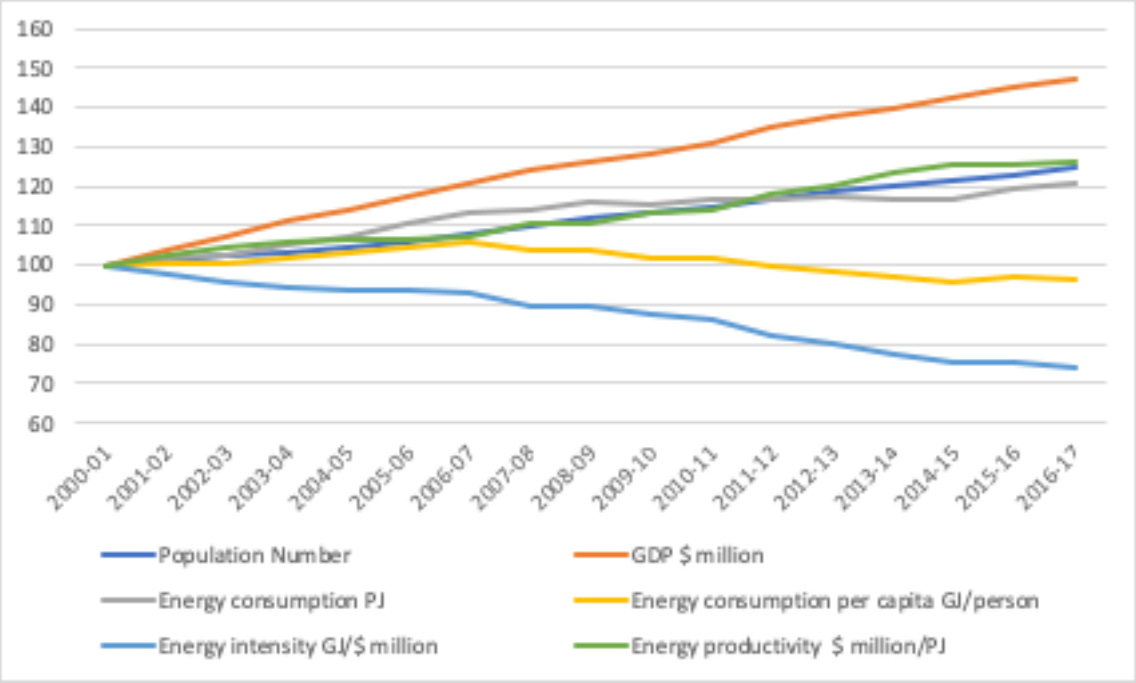
our national energy spend (over $120 billion/year, nearly 8% of GDP), to restore business competitiveness, and to meet our emissions targets. Given the poor outcomes achieved in the intervening years, that target is now aspirational for 2030, but is achievable by 2035. The graphs below provide some context for the task at hand.

Australia: Energy productivity - Ambition vis actual (Base year 2009-10)



Source: Australian Energy Update 2018, Department of the Environment and Energy

Australia: Energy productivity and other metrics (Base year 2000-01)



Source: Australian Energy Update 2018, Department of the Environment and Energy

In December 2015 COAG Energy Council released its National Energy Productivity Plan (NEPP) aimed at improving energy productivity by 40% from 2015 levels by 2030; energy productivity being measured by GDP/primary energy. The first two reported years of NEPP 'implementation' resulted in almost a flat-lining of energy productivity (-0.1% and +0.9% in the first two years respectively), at a time when competitors are improving energy productivity by well over 2%

annually and from better baselines. This outcome is especially disastrous as EP is measured as GDP/primary energy use, and GDP increased 3.2% and 1.6% in these years.

A2EP is developing a replacement for the NEPP, NEPP 2.0. This comprehensive restart to the project will be available shortly. In the meantime and for the purposes of the Inquiry, we attach the draft of a framework for Australia's transition to an electricity system that is genuinely fair dinkum, a system that is genuinely consumer-centric.

Should you have any questions or require further information please contact Tony Westmore, General Manager, by email at . We wish you all the best for your investigation.

Yours sincerely
Australian Alliance for Energy Productivity

Jonathan Jutsen
Chief Executive Officer
15 February 2019

AUSTRALIAN ALLIANCE FOR ENERGY PRODUCTIVITY

Doing more. Using less.

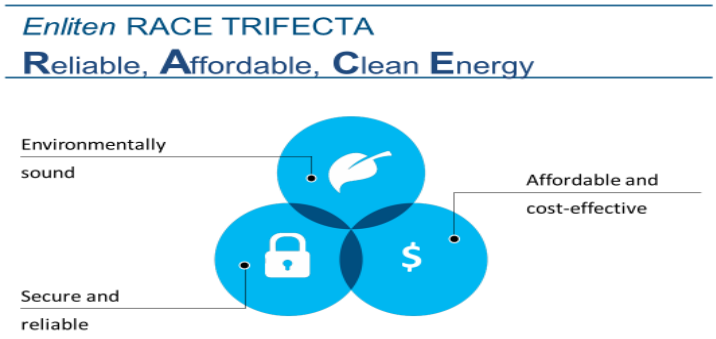
ENLITEN - Australia's Energy Transition

The last decade of divisive energy and climate policy debate has destroyed value and left the Australian public despairing at high energy costs and steadily increasing carbon emissions, with little hope of constructive, long term solutions from our political leaders. The unfortunate language of the 'trilemma' painted a future of dealing with irreconcilable conflicting objectives.

But there is another way. There is a creative approach to energy and climate issues which creates value. It is time to map out a path for Australia's energy transition, which addresses the opportunity for simultaneous achieving affordability, energy security and reliability, and low carbon outcomes. Taking this view, we see a trifecta of integrated opportunities, which will deliver multiple benefits.

Borrowing from the German concept of an Energiewende (energy transition), we propose a model for transition for Australia. We've given this approach a unifying name, 'Enliten' to signify a brighter, positive approach to gain benefits by harnessing and directing inevitable change.

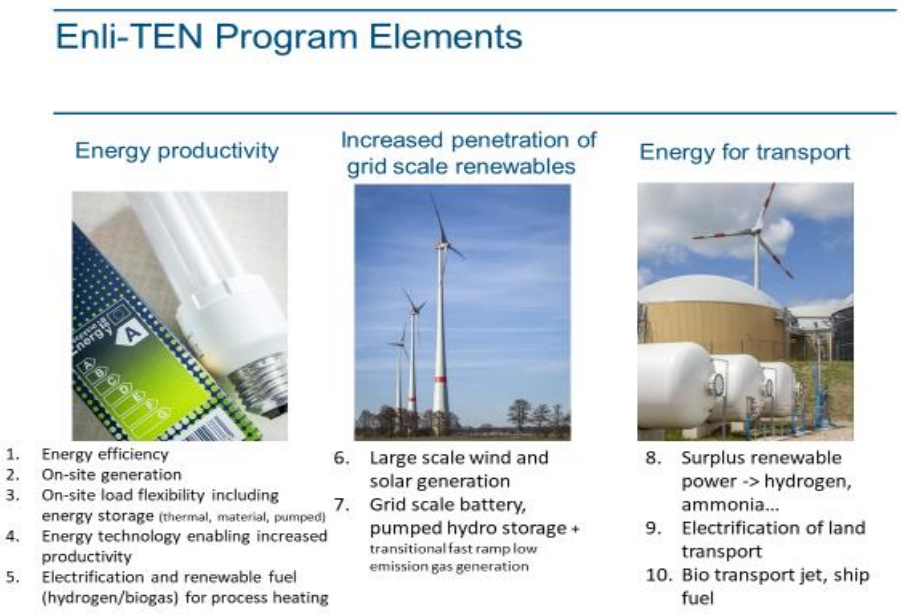
A significant advance in the Enliten concept compared with other Australian energy transition plans proposed is the strategic focus on energy productivity including energy efficiency. Energy productivity reduces gross energy demand during the year, peak energy demand at any given moment and total carbon dioxide emissions; it enhances electricity system reliability and lower total system bills even at a constant price per megawatt hour. Energy productivity improvements tick all the boxes, but to date have not been invested in sufficiently.



There is in fact no reason why we can't have it all – reliable, affordable and clean energy. To achieve the trifecta, we need to implement an integrated strategy, rolling our three elements in concert:

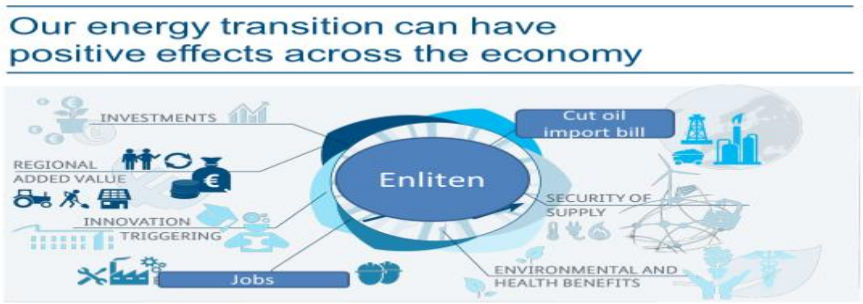
ENLITEN - Australia's Energy Transition

1. **Energy productivity on energy user sites** (factories, offices and homes) is key, from improving energy efficiency of buildings, processes and equipment; from distributed generation; using demand control to match volatile energy supply (including use of storage - thermal storage e.g. hot or cold water, pumped, material storage, or batteries), applying energy to enable greater value (e.g. controlling refrigeration of perishable food based on real-time temperature + location monitoring, reducing food waste); and replacing fossil fuel heating with electricity technologies (e.g. heat pumps) or renewable fuels (e.g. biogas from waste digestion).
2. **Large scale renewable generation** of electricity using solar or wind, together with investment to reduce supply volatility like batteries, pumped hydro or fast ramp gas fired generation (but note that end user demand management should come first, as it is lower in cost and commercial risk).
3. **Energy for Transport:** Sourced from using excess renewable energy to generate hydrogen, electrification of land transport, or production of bio-fuels from wastes or other organic sources, which is needed particularly to decarbonise air transport and shipping.



Through this 3-pronged integrated approach, we can simultaneously:

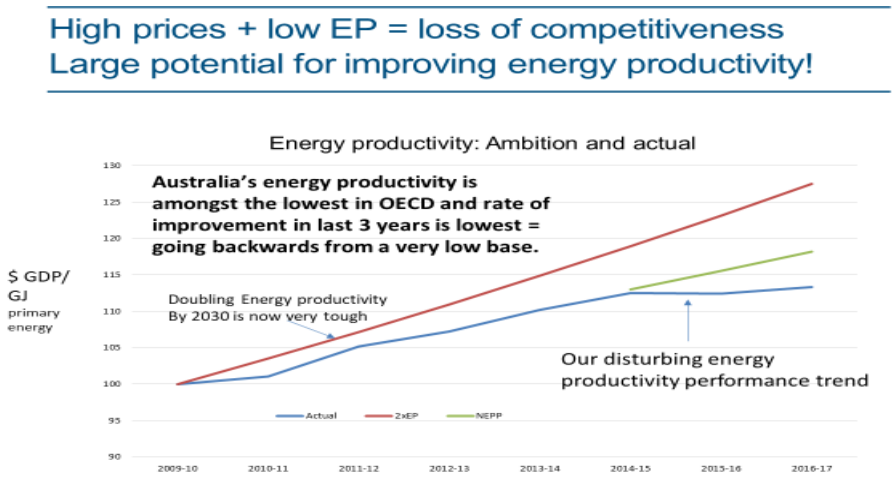
1. Improve energy affordability and boost cost competitiveness of business
2. Reduce carbon emissions and achieve climate targets
3. Achieve an orderly phase out of coal power generation
4. Stimulate innovation across the economy
5. Improve electricity supply reliability and gas supply security by reducing demand
6. Reduce transport fuel imports and enhance liquid fuel security.
7. Create 250,000 new jobs in a decade.



Looking at these benefits in more detail:

1. **Improving energy competitiveness and affordability**

Improving energy productivity is the glue that makes the trifecta possible. It allows carbon mitigation and accelerated renewables to be done economically. Every alternative model fails without energy efficiency at its centre. The Germans found this out from experience, when they realised that they needed to refocus their plan to make energy efficiency the centrepiece to deliver the promise of the transition. In Australia, there has been an almost total neglect of the central support for an energy transition. This is particularly surprising given our poor energy efficiency and productivity, which is amongst the lowest in the OECD, and our rate of improvement is the worst.



We have an economic imperative to boost energy productivity because Australia generates less value with each unit of energy deployed than other developed countries, and combined with the rapid increase in energy prices in the last decade, we now have a competitive disadvantage in energy costs.

The Australian Alliance for Energy Productivity (A2EP) has committed to a 2xEP program = doubling Australia's energy productivity from 2010 levels by 2030. But Australia is deviating further away from this aspirational trend line every year, and we even failing to achieve the government's more modest target of increasing energy productivity by 40% from 2015 levels (barely more than what used to be 'business as usual'). We need to accelerate back to a doubling trend line and more, due to our poor performance in the last 3 years.

Enliten targets a 4.5% annual improvement in EP to restore energy competitiveness. We see this being achieved through better utilising energy to create value, and by using less. Enliten (like Energiewende) targets halving our total consumption of energy by 2050 through 2% annual reduction of energy use through efficiency improvements.

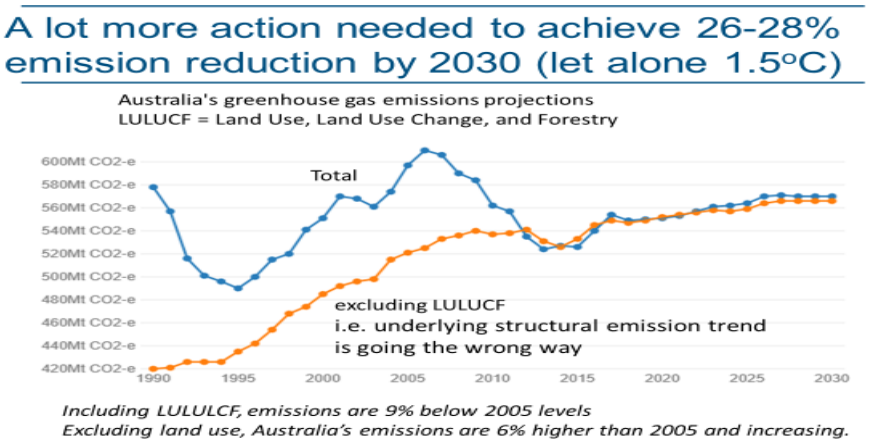
To bring a focus onto achieving rapid energy productivity improvement, A2EP has developed a draft energy productivity plan (NEPP 2.0). The Commonwealth through the COAG Energy Council announced a national energy productivity plan (NEPP) in December 2015 to achieve its EP target, but has failed to either adequately fund and resource the plan, or to include specific deliverables and timetable in its plan. It also misses out on meaningful measures for several key sectors.

The key elements of NEPP 2.0 are:

- **Set and deliver a target for annual improvement in energy productivity of 4.5%**; a doubling of energy productivity by 2035. This target is ambitious but achievable through an aggressive and comprehensive program that harnesses innovation across the economy.
- **Establish a National Energy Productivity Authority** with an independent board, to co-ordinate and monitor delivery of the NEPP for at least a 10 year period.
- **Fund implementation of NEPP through long term Commonwealth budget commitments** (ideally a 4+ years rolling). NEPP 2.0 proposes appropriate resource levels to deliver programs required to achieve the national target.

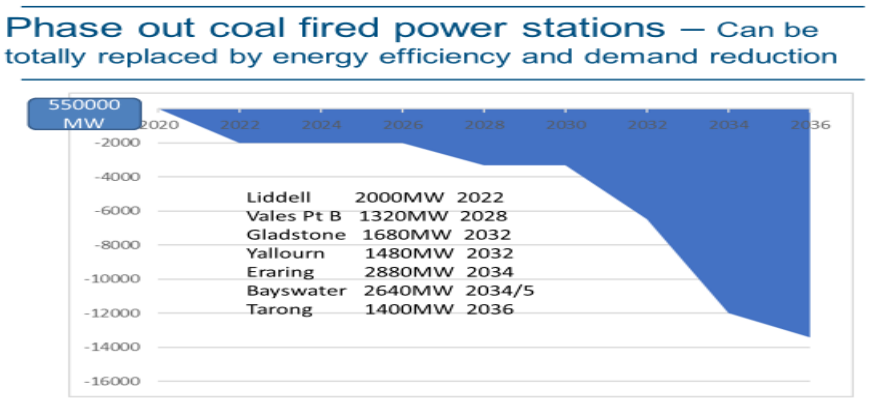
2. Reduce carbon emissions to meet internationally agreed targets

Enliten also addresses our carbon mitigation obligations, and provides an economical way to meet our existing Paris targets – Energtics' modelling in 2015 showed that we could achieve 2/3 of the target from 2xEP (though this is a challenge now given our limited gains in recent year). It also will greatly assist going well beyond the Paris target, as will be required as Australia's share of the challenge to limit global warming to 1.5°C. Far more needs to be done to reduce carbon emissions from the Australian economy, and urgent action is required to meet our international obligation. Apart from 2012-2015, Australia's underlying emissions have consistently increased.



3. Orderly phase out coal-fired power stations

Enliten offers an economical way to deal with the challenge of an orderly phase out of coal fired power stations as they reach their economic life. This can be achieved through meeting the proposed energy efficiency and demand reduction goals in the Enliten plan. The following diagram shows the current expected timetable for coal plant closures.



4. Stimulate innovation

It is essential that Australia establish a national energy productivity innovation program to accelerate development, application and technology transfer of the technologies needed to deliver Enliten goals, and to ensure that we have a chance to gain commercial benefit to our economy from leading in at least some niche aspects of the transition. The NEPP2.0 draft proposals suggest extending the life of ARENA, changing its mandate to be the Energy Innovation & Transformation Authority, with at least an additional 4 years forward funding (through to 2027), and a focus on energy productivity. It would continue to fund innovation grants to accelerate adoption of best practice technology by reducing risk of early adoption, and we proposed minimum funding for energy productivity measures of $300 million over first 3 years from 2019-20.

Proposed Innovation Priorities:

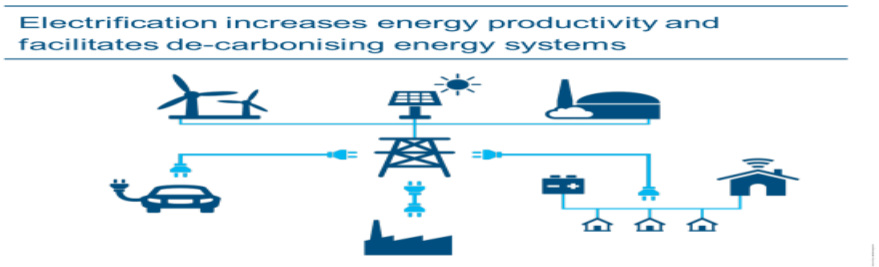
The focus of innovation funding should be on the key tools which underpin Enliten and particularly on innovation in energy productivity which has largely been neglected in Australia.

Integration is essential to achieve Enliten objectives. This includes an integrated approach to:

- Energy, carbon, reliability and security policy
- Demand (prosumers) and the energy supply systems
- Generation, storage, efficiency and demand management
- Optimising energy productivity along value chains (rather than only focusing on each separate process and sector
- Energy supply between sectors – e.g. use of surplus renewable generation to produce transport fuels

Information and the new opportunities from digitalisation (IOT, cloud computing, AI) facilitate this transition. IOT for the first time enables energy suppliers accurate, timely and granular visibility of energy uses, losses and storage, and can provide energy users with visibility of real time pool and network congestion costs to allow them to modify their loads to minimise the cost of purchase power. So, all parties in the energy system can be empowered by ubiquitous information to act in their own interest to optimise productivity of the network and reduce costs.

And digitalisation enables an 'internet of energy' which supports networks of producers, marketers, and prosumers, including new market entrants with radically different business models for buying and selling energy. This provides greater options and flexibility of all parties to optimise their energy use and generation.



Electrification is a key tool to boost energy productivity and facilitate decarbonisation. The replacement of fossil fuel heating, cooking, dewatering and transport with electricity

technologies that use energy far more productively (e.g. replacing a 35% efficient gas fired boiler and steam distribution system with an electric heat pump with a COP of 5), facilitates the more widespread application of renewable sources electricity to supply energy to these applications.

5. **Improve electricity supply reliability and gas supply security by reducing demand**

The combination of increased energy efficiency to reduce absolute energy use, and demand management to change electricity use vs time, can significantly improve electricity and gas supply reliability.

The concept of reliability needs to be reviewed in Enliten. Increasingly electricity users are consuming, generation and storing energy (not only in batteries but also in the form of thermal, material and pumped storage), and using this capability to become potentially a more flexible energy user. As a result, the concept of the grid being a reliable supplier of energy needs to be re-evaluated. It may be a better solution to provide customers with flexible pricing and perhaps investment in their facilities that encourages and support demand that matches available supply.

And, with a tight supply/demand situation for natural gas, reducing gas demand through efficiency and by consumers finding alternatives to natural gas for heating and other applications, the price of natural gas could fall significantly.

6. **Reduce transport fuel imports and enhance liquid fuel security.**

Australian refineries currently import 83% of the crude oil they process, and we are also a major importer of refined petroleum products like diesel, meaning in total we are dependent on imports for over 90% of current usage. Despite this increasing import dependency, we hold significantly less oil stockpiles than recommended by the IEA. Our net imports are expected to be over $25B this year. Enliten would act to reduce consumption, thus reducing net imports and improving our fuel security.

7. **Create 200,000+ new green jobs in a decade**

Scaling from the number of jobs created in the clean energy and energy efficiency industries in California and Germany, the Enliten program could potentially deliver over 300,000 jobs over the next 10 years. To put this in perspective, coal power generation employs 10,000 people and the coal industry less than 50,000.

For example, in California, there are estimated to be 520,000 green jobs, 310,000 in energy efficiency, 155,000 in renewable energy, 30,000 in smart grid and storage, 20,000 in clean vehicles and 5,000 in renewable fuels. This is 430,000 more jobs than in the fossil fuel industry. Scaling by population this would scale to 325,000 Australia green jobs.

Germany estimates many more jobs are being created by the Energiewende – as the Federal Ministry of Industry and Energy found 1.2 million green jobs created - 848,000 jobs in energy efficiency and 371,000 jobs in renewables. Again, scaling to the Australian population this equates to 370,000 Australian green jobs. In the UK, it is estimated there are about 235,000 green jobs, most of which are in energy efficiency.

There are no accurate statistics on existing employment in these industries in Australia, but are estimated to be around 50,000 jobs, most of these in energy efficiency.

ENLITEN Targets

These are the targets we need to meet to deliver Enliten, to provide a transition of the Australian economy that will deliver all of the desired targeted outcomes simultaneously and deliver a more sustainable economy with more jobs.

TARGETS

Energy Productivity:
4.5% Annual improvement target (assumes annual GDP growth 2.4%)
2030: EP 60% greater than 2019
2035: EP doubled from 2019
2050: 4 times greater by 2050

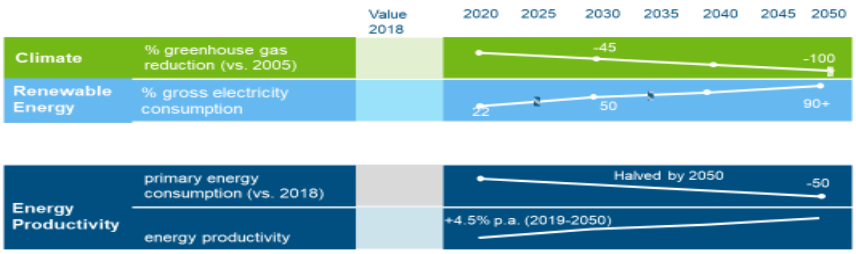
Renewables in power mix:
2020: 23%
2030: 50%
2050: 90+%

Carbon:
2030: -45%
2050: zero net

Total Primary Energy Consumption
Halved by 2050 (2% annual reduction)
Electricity reduction (4TWh/year, 1100MW/year).

Electricity peak reduction:
2020: -7.5%
2025: -15% (8000MW).

Enliten integrated energy/climate targets



5 yearly milestones need to be agreed for tracking of the delivery of each of these targets.

In conclusion, Enliten offers a unifying strategy to bring together the elements: targets, technologies, and critically consensus of people needed to simultaneously address our energy and carbon challenges and opportunities.