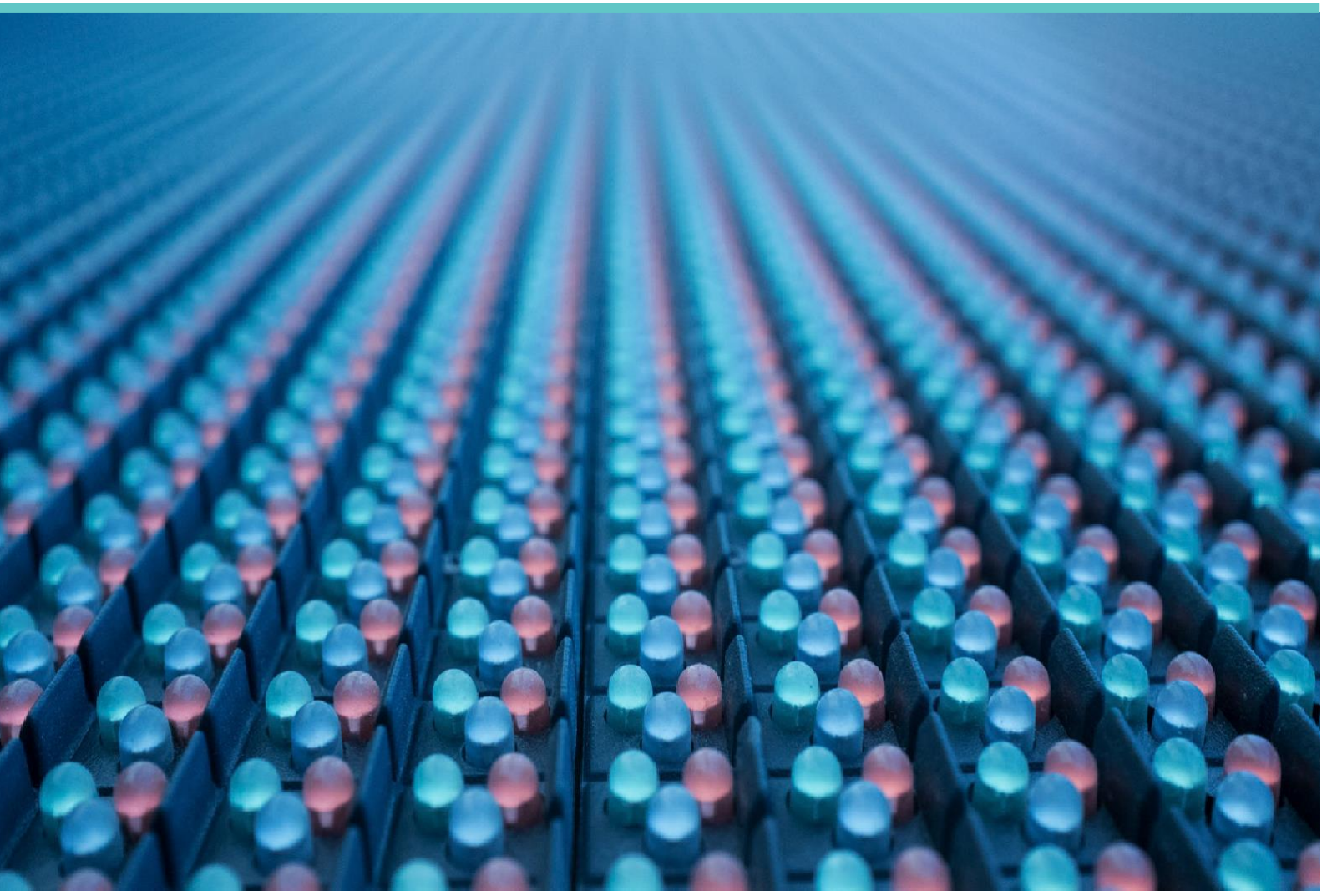
Australian Government

COAG Energy Council



NATIONAL ENERGY PRODUCTIVITY PLAN 2015–2030

Boosting competitiveness, managing costs and reducing emissions

ANNUAL REPORT 2016

Disclaimer

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1. Executive summary

The National Energy Productivity Plan (NEPP) has progressed rapidly, with Australia on its way to meeting its 40 per cent National Energy Productivity Target. By supporting smarter energy choices and better energy services, the NEPP is ensuring Australians get more value from the energy we consume.

The NEPP is also making an important contribution to Australia's climate goals. It is expected to contribute more than a quarter of the savings required to meet Australia's 2030 greenhouse gas emissions reduction target.

Since its release in December 2015, many NEPP measures have made significant progress, including:

- the Commonwealth's introduction of a **Clean Energy Innovation Fund** and its commitment to expand the role of the **Australian Renewable Energy Agency**, which will support more innovative approaches to improving energy productivity
- the Commonwealth's expansion of the **Commercial Building Disclosure** program, which will lead to an estimated $50 million in new energy savings, and about 3.5 million tonnes of carbon dioxide equivalent reduction over five years
- implementation of the Energy Council's new prioritisation plan to accelerate the impact of the successful **Equipment Energy Efficiency program**, with new proposed standards released on air conditioners and refrigerated cabinets

To maintain the NEPP's momentum, the Commonwealth has provided more than $10 million in funding across a range of activities. The COAG Energy Council has also committed a further $8 million in its 2016–17 budget to support collaborative work.

Further progress is expected in 2017, including:

- consideration of proposed measures to reduce Australia's light vehicle emissions through the Ministerial Forum on Vehicle Emissions
- the introduction of cost-reflective electricity pricing and competitive metering
- consideration of opportunities to improve energy productivity in the Commonwealth Government's operations.

Challenges and opportunities over the next 12 months include:

- developing measures to capture more **opportunities for business and industry** to contribute to the energy productivity target and to reduce emissions
- supporting effective uptake of new types of demand management services, including **cost-reflective electricity pricing** and **competitive metering,** for the maximum benefit of all consumers
- considering relevant recommendations of the Commonwealth's **review of climate change policies** and the **independent review into the reliability and security of the National Electricity Market** (the Finkel Review).

With the on-going support of Australian governments, the NEPP will continue to provide an economic boost to consumers and business, and to make a vital contribution to Australia's emissions reduction commitments.

2. Introduction

On 4 December 2015, the Energy Council adopted the National Energy Productivity Plan (NEPP) and an initial work plan of 34 measures to:

- boost competitiveness and growth
- help families and businesses manage their energy costs
- reduce greenhouse gas emissions.

The NEPP will deliver the Commonwealth's commitment to improve Australia's energy productivity by 40 per cent between 2015 and 2030.

It is also expected to contribute around a quarter of the additional savings required to meet Australia's international obligation under the Paris Agreement [1] to reduce greenhouse gas emissions by 26 to 28 per cent below 2005 levels by 2030.

By playing a key role in better coordinating reforms across energy markets, energy efficiency and climate policy, the NEPP facilitates effective planning to reduce emissions at least cost.

A summary of the NEPP framework is given in Figure 1.

The Energy Council committed to continuously monitoring measures and reviewing the work plan. This first annual report will detail and report on progress.

While this is only the first year in a 15 year plan, the NEPP is already progressing well. Over 2016, all measures across the work plan have advanced and many have achieved significant outcomes. These outcomes and their expected impacts are laid out in this document.

The report also looks forward, presenting expected outcomes, challenges and opportunities over the next year and highlighting the ongoing effort required. During 2017 this will include the development of a more in-depth metrics framework to track the NEPP's impact.

In 2017, the New South Wales and Victorian governments are planning to release strategies to improve energy efficiency in their respective states. These strategies will contribute to and add momentum to increasing Australia's energy productivity. Many of the measures in these state-based energy plans are complementary to the NEPP and are well aligned with its current measures.

[1] Under the United National Framework Convention on Climate Change (UNFCCC)

3. Measures in the NEPP work plan

The NEPP will drive change and accelerate energy productivity improvement through measures which support:

- *smarter energy choices* by providing more efficient incentives, empowering consumers and promoting business action
- *better energy services* by driving greater innovation and more competitive and modern markets, and updating consumer protections and standards.

The 34 agreed NEPP measures are grouped under these overarching themes (Table 1).

The following sections provide updates on progress made against the different themes, focusing on key achievements to date, expected outcomes over the next 12 months and key challenges and opportunities for the future.

Figure 1: Overview of the National Energy Productivity Plan

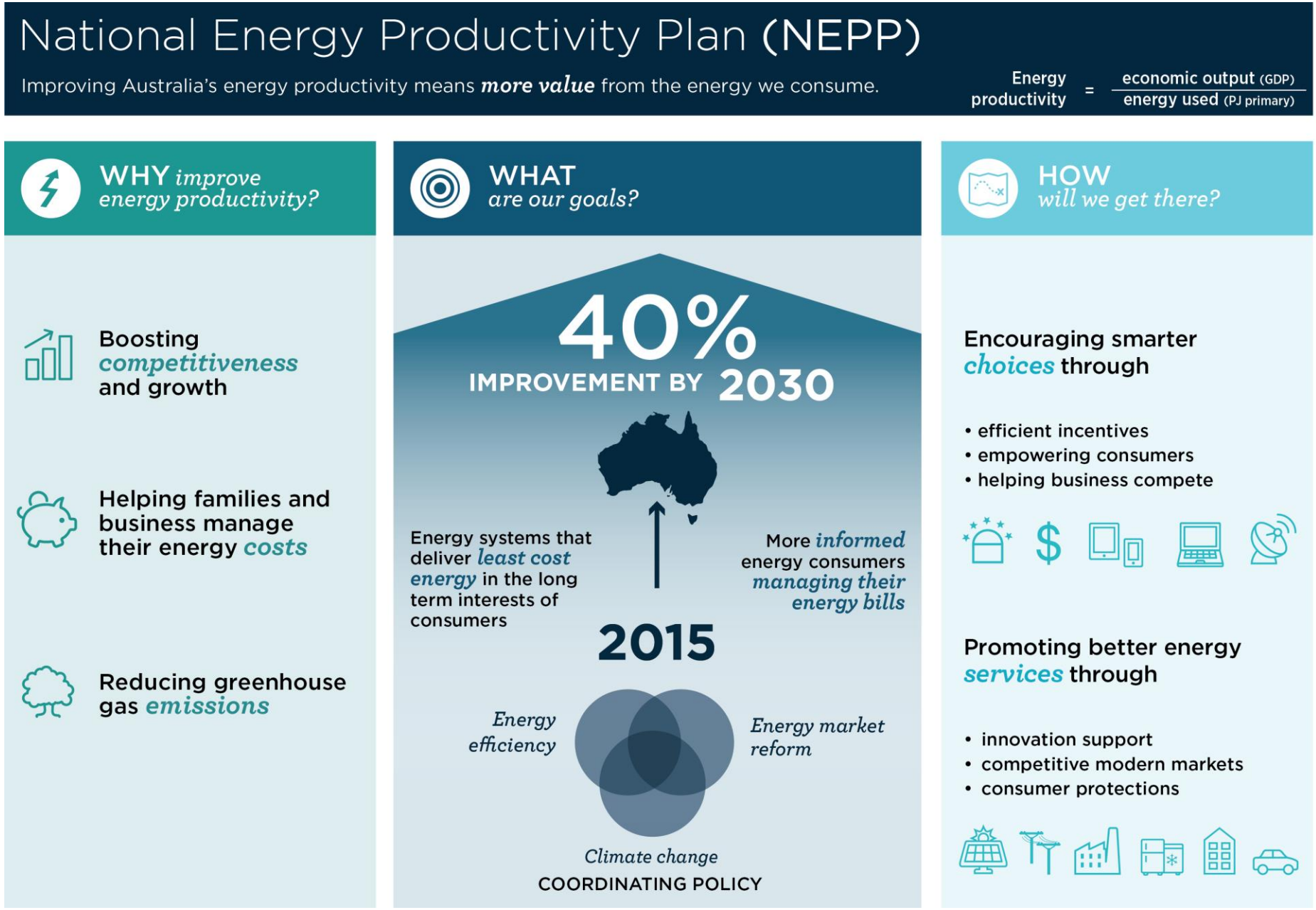


Table 1: National Energy Productivity Plan measures and their overarching themes

SMARTER ENERGY CHOICES

EFFICIENT INCENTIVES

1. Transition to cost-reflective pricing
2. Market mechanisms to capture societal benefits

EMPOWERING CONSUMERS

3. Make choice easier
4. Support best practice services for vulnerable consumers
5. Improve residential building energy ratings and disclosure

HELPING BUSINESS COMPETE

6. Help business self-manage energy costs
7. Recognise business leadership and support voluntary action
8. Research business benchmarks and success factors
9. Expand commercial building ratings and disclosure
10. Improve fuel efficiency in aviation and maritime sectors
11. Reduce barriers to financing
12. Improve energy productivity in government

BETTER ENERGY SERVICES

INNOVATION SUPPORT

13. Support innovation and commercialisation
14. Improve light vehicle efficiency
15. Drive innovation in transport and infrastructure systems
16. More liveable, accessible and productive cities
17. Promote leading practice
18. Collaborate internationally

COMPETITIVE MODERN MARKETS

19. Emerging technologies in the electricity system
20. Deliver reforms to the gas market
21. Reform governance to keep pace with change
22. Develop an Energy Use Data Model for better planning
23. Competitive smart meter rollout
24. Improve the exchange of market data
25. Build service provider capacity
26. New market mechanisms for demand response
27. Promote competitive retail markets in electricity and gas
28. Monitor the wholesale market
29. Adopt National Frameworks

CONSUMER PROTECTIONS

30. Deliver a new Equipment Energy Efficiency (E3) prioritisation plan
31. Advance the National Construction Code
32. Improve compliance with building energy efficiency regulation
33. Review the National Energy Customer Framework for disruptive technologies
34. Review Fuel Quality Standards Act

a. Smarter energy choices

Efficient incentives

With more efficient incentives we can better align the benefits to individual consumers with benefits for all Australians. This can reduce current problems that are driving significant unnecessary costs, such as peak congestion, inequitable cross-subsidies and environmental impacts.

Achievements to date

- The Commonwealth's Emissions Reduction Fund is creating incentives for energy productivity activities through eight different sector methods: aggregated small energy users; commercial buildings; commercial and public lighting; high efficiency commercial appliances; industrial electricity and fuel efficiency; refrigeration and ventilation fans; aviation transport; and land and sea transport.
    - As at 24 November 2016, 52 projects have been registered across these sectors, with contracts estimated to cover around five million tonnes of emissions abatement.

Expected outcomes over next 12 months

- The new cost-reflective network prices begin in 2017. This initiative aims to give consumers a much wider range of tariffs to choose from and better incentives to save energy at costly peak times.
- State and territory energy efficiency schemes have continued to drive strong activity, particularly in commercial lighting upgrades. State and territory officials have been working together to reduce red tape and maximise consumer benefits by further aligning jurisdictional schemes. In 2017, their work will focus on updating methods collaboratively, aligning compliance frameworks, sharing compliance information and standardising language.

Key challenges and opportunities

- The introduction of demand management measures such as cost reflective pricing requires careful management. Important contributors to securing the benefits of cost reflective pricing include an appropriate transitioning period, effective engagement by networks and retailers with consumers, new innovative tariff products and consumer and community engagement and education. Several other NEPP measures, such as making choice easier and related data work, are seeking to support these measures.
    - These demand management services are important for energy productivity because they have the potential to decrease electricity bills by shifting electricity use away from costly peak times. They also support better ways to reduce individual bills, using smart energy management apps and smart appliances, and greater benefits from emerging technologies such as batteries and electric vehicles.
- There may be relevant recommendations on energy productivity from the Commonwealth's 2017 review of Australia's climate change policies, which seeks to ensure climate policies remain effective in achieving the 2030 climate target. The NEPP is a strong contributor to low-cost carbon abatement and is estimated to deliver around a quarter of the new abatement required.

Empowering consumers

Increasing choice in new energy services, tariffs and technologies can be of great benefit to consumers. However, greater choice can also make decisions more complex and lead to consumers paying more for their energy than they need to. For the best outcomes, we need to make choice easier for consumers by supporting them with the right tools and information.

Achievements to date

- The Commonwealth has provided a $2 million grant to Energy Consumers Australia, over three years, to lead research on practical ways to make household energy choices easier, including measures to support vulnerable consumers**.**
- The Energy Council has agreed to a national collaborative approach to residential building energy ratings and disclosure.
  - Principles have been established to guide jurisdictions working together as schemes are developed to allow home owners, buyers and tenants to understand, compare, value and act on the energy performance and comfort level of residential buildings.

Expected outcomes over the next 12 months

- Energy Consumers Australia will initially conduct research to gain a better understanding of how different types of energy consumers make decisions. Working with stakeholders, this knowledge will be used to develop and test better tools to help consumers manage their energy bills. Related work is underway reviewing existing decision tools and improving access to consumer data to support new tools such as smart apps.
  - The Commonwealth is undertaking trials to test improvements to appliance labels. These trials will measure how different labels inform and influence consumers in choosing more efficient appliances.
- Victoria will further progress its Residential Energy Scorecard, while New South Wales will undertake research and trials on a range of residential building information schemes.

Key challenges and opportunities

- Providing some of these improved decision tools will be key to supporting new services, including energy efficiency assessments for households and the introduction of new forms of tariffs. These tools can promote uptake and can help consumers make sure they are selecting the best new services for their needs.

Helping business compete

The Energy Council supports the business and public sectors showing leadership in improving energy productivity and competitiveness. Work is underway with the sectors to develop a range of options to support voluntary action and market approaches.

Achievements to date

- The Commonwealth has committed to lowering the threshold of the Commercial Buildings Disclosure program from 2000 to 1000 square metres on 1 July 2017.
  - This will see an additional 1000 commercial buildings covered by the program.
  - This will deliver more than $50 million in energy savings, and about 3.5 million tonnes of emissions reductions over five years.
- The Commonwealth has retained and refocused the Clean Energy Finance Corporation to support ongoing investment into clean and renewable energy.
- The industry-led Doubling Australia's Energy Productivity (2xEP) Steering Committee has developed and published collaborative roadmaps on how to double energy productivity in the manufacturing, agriculture, mining, built environment and passenger transport sectors.
- The Street Lighting and Smart Controls program, initiated by the Institute of Public Works Engineering Australasia (IPWEA), has released its roadmap. This seeks to accelerate the adoption of modern street lighting technologies and practice (including LEDs and smart controls) by local councils across Australia.

Expected outcomes over next 12 months

- The Commonwealth consider options to improve energy productivity in its operations.
  - This could deliver energy, cost and emissions savings for the Commonwealth.
  - It could also demonstrate leadership and drive innovation and market development in related technologies and services through purchasing power.
- The Commonwealth will undertake research to underpin the development of tools to help businesses better understand their own energy performance, the benefits of improving their energy productivity and competitiveness and how to improve it.

Key challenges and opportunities

- Further measures to capture energy productivity opportunities in the business sector will be needed to reach NEPP objectives (see section 4). This work should consider input from the Doubling Australia's Energy Productivity (2xEP) sectoral roadmaps, new research on business performance and developments in wider climate policy.

b. Better energy services

Innovation support

In line with its wider innovation agenda, the Commonwealth is strongly committed to supporting greater innovation and commercialisation of new technologies and practices that improve energy productivity and modernise Australia's energy sector with better energy services.

Achievements to date

- The Commonwealth has committed funding across the innovation chain, including:
  - over $1 billion for the Australian Renewable Energy Agency (ARENA) to spend on new projects in innovative research, development and demonstration. There is also a commitment to broaden ARENA's mandate to allow support for innovation in energy efficiency and productivity, as well as renewables
  - $100 million per year in the Clean Energy Innovation Fund to provide financial investment support for emerging technologies to become viable.
- The Commonwealth has established a Smart Cities Plan, which includes the $100 million per year Sustainable Cities Investment Fund. Their aim is to accelerate the deployment of clean energy, renewable energy and energy efficiency technology in cities.
  - This will be partially driven through negotiation of initial City Deals. The Townsville City Deal, Australia's first, was signed on 9 December 2016. It includes commitments to manage energy costs and to boost energy productivity. Potential measures outlined in the City Deal include upgrades to commercial buildings, smart water solutions and a cooling district within the CBD.
  - Launceston and Western Sydney City Deals will be negotiated with state and local governments in 2017.
- Australia has progressed its international collaboration on energy efficiency measures, which seeks to facilitate technology transfer between countries and common standards:
  - Australia played an instrumental role in the G20 adopting the G20 Energy Efficiency Leading Programme, which provides the basis for strengthened G20 voluntary collaboration on energy efficiency.
  - Australia has been voted as chair of the International Energy Agency Energy Efficient End-Use Equipment program.

Expected outcomes over the next 12 months

- The Ministerial Forum on Vehicle Emissions will consult on options to reduce emissions from Australia's light vehicle fleet during 2017.
- The Commonwealth will release a Low Emissions Technology Roadmap to consider the potential for low emissions technologies in the energy, industrial and transport sectors to meet or exceed Australia's emissions reduction targets.
- ARENA's mandate change will be progressed through regulation changes and new energy productivity programs developed.

Key challenges

- Close engagement with a diverse group of stakeholders will be required to gain agreement on options to reduce emissions from light vehicles.

Competitive modern markets

Capitalising on the transformative change currently underway in energy markets as they adjust to new disruptive technologies and services is a critical part of improving energy productivity. Effective competitive markets which enable new services and technologies are key to managing this change.

Achievements to date

- The Energy Council has progressed work with stakeholders on a range of issues to manage the emergence of new technologies. This includes consultation papers on registration of energy storage (battery) systems, consumer protections and stand-alone systems. The results of these consultations are currently being considered for further recommendations.
- The Energy Council Gas Market Reform Package has also progressed strongly, including:
  - delivery of the *Coverage Criteria Examination* report, which has provided recommendations aimed at improving commercial outcomes from pipeline negotiations.
  - establishing the Gas Market Reform Group, led by Dr Michael Vertigan.

Expected outcomes over the next 12 months

- The CSIRO is working with stakeholders to develop the $6 million Energy Use Data Model to support better forecasting and planning. In 2017, the CSIRO will develop a pilot system for use by industry, government and researchers to support better energy forecasting and more informed policies. This will include new survey data linking smart meter data to detailed drivers of energy use, such as household demographics and appliances.
- The Australian Energy Market Commission will make a final decision on a demand response mechanism, which was proposed under its Power of Choice review with the aim of supporting a range of cheaper options for peak power supply.
  - The draft decision released in September 2016 proposes not to introduce a demand response mechanism in the wholesale market but supports progressing related ancillary services.
- New investments in smart meters are beginning, with new meter providers anticipating the start of new competitive metering rules in December 2017. Industry is working to finalise supporting procedures. This is linked to wider considerations on improving data access and transparency in the market.

Key challenges and opportunities

- In response to the events surrounding the complete loss of power in South Australia on 28 September 2016, the Council agreed it was timely for a wider independent review to take stock of the current state of the security and reliability of the National Electricity Market (NEM), and provide advice to governments on a coordinated, national reform blueprint. This will be undertaken by the Chief Scientist, Dr Alan Finkel AO.
  - The Independent review into the reliability and security of the NEM will provide insights into the management of emerging technologies and is likely to have implications for future improvement of energy productivity.

Consumer protections

Where the market does not provide efficient minimum services and adequate protections for consumers, there is a role for government measures, such as standards for equipment, appliances and buildings and service requirements for consumers.

Achievements to date

- The Energy Council is implementing its new prioritisation plan to accelerate the Equipment Energy Efficiency program, with funding of $3.2 million in 2016 –17.
  - Consultation Regulation Impact Statements have been released proposing new minimum energy performance standards for four of the six priority products (air conditioners and refrigerated cabinets, swimming pool pumps and lighting).
- The Energy Council has initiated work aimed at improving the energy efficiency of buildings (funded over 2016 –17 by $1.7 million), which includes:
  - the Australian Building Code Board considering higher stringency for energy efficiency in commercial building standards in the 2019 Code review, and strengthening the foundations for future increases in residential building standards
  - research being undertaken by the Commonwealth Department of the Environment and Energy to support proposed higher residential building energy efficiency standards
  - the National Australian Building Energy Rating System (NABERS) team working to accelerate the development of new tools for commercial buildings and apartment blocks.
- An independent review of the *Fuel Quality Standards Act 2000* was completed, with recommendations to retain and amend the Act. The Commonwealth is now reviewing the legislative instruments under the Act, which are due to sunset in 2019. This review forms part of the work being undertaken by the Ministerial Forum on Vehicle Emissions to reduce motor vehicle emissions that harm our health and contribute to greenhouse gas emissions.

Expected outcomes over the next 12 months

- Release of the Consultation Regulation Impact Statements for the remaining two priority products under the Equipment Energy Efficiency prioritisation plan: non-domestic fans and fridge-freezers.
- The Energy Council will further consider the level of consumer protections needed for energy supply products and services ‘behind the meter’.

Key challenges

- Research to develop the evidence base for higher residential building codes will require a range of new approaches and strong engagement with stakeholders.

4. Progress towards the target

a. Update on Australia's current performance

Australia is continuing to improve its energy productivity.

In 2014–15 Australia's energy productivity rose to $274 million GDP per petajoule ($m/PJ) of energy consumed.[2] This sets the baseline for the targeted 40 per cent improvement in energy productivity between 2015 and 2030 (Figure 2).

However, the annual improvement of 1.48 per cent in 2014–15 was lower than the average over the last 15 years of 1.69 per cent. It was also significantly lower than estimated annual average improvement of 2.26 per cent needed to reach the NEPP's 2030 target.

This shows that NEPP measures, while progressing well in early stages, must make a substantive impact in coming years if the target is to be achieved.

Figure 2: Energy productivity: historical and projected to reach 40 per cent target by 2029–30 financial year

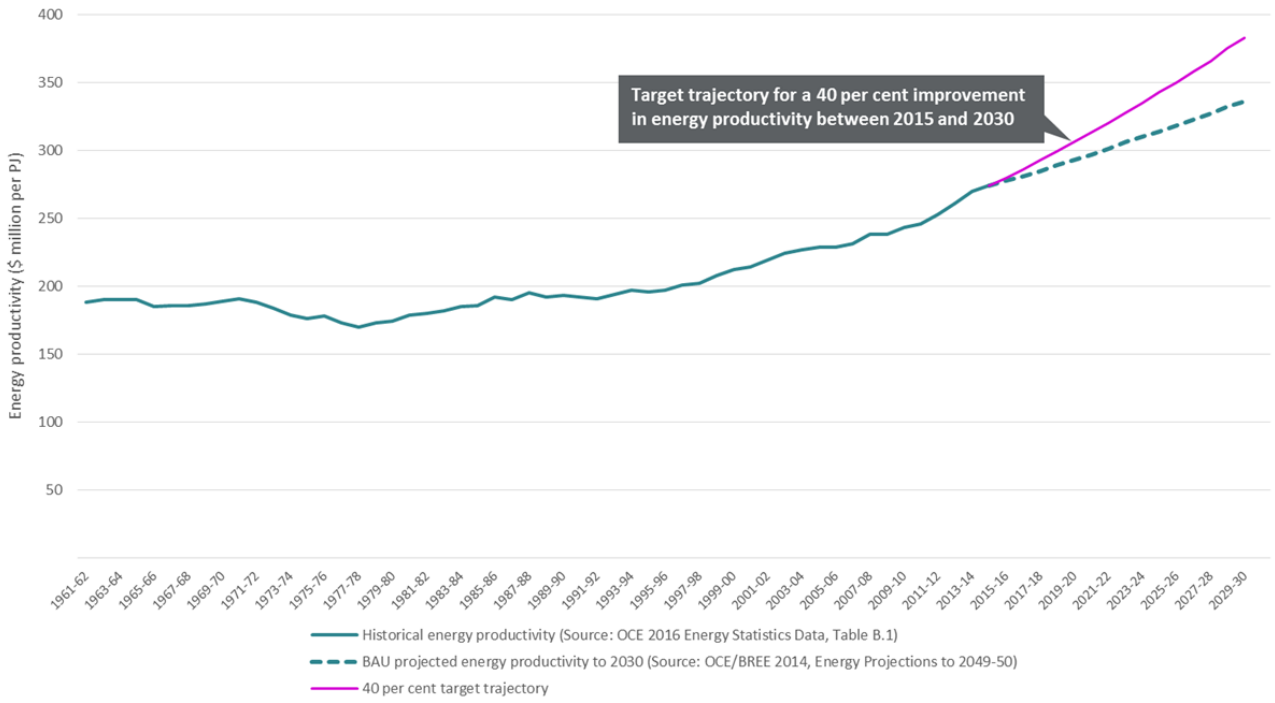


Chart note:
In accordance with OCE/BREE (2014) Australian Energy Projections, all projections in this chart assume GDP grows at an annual average of 2.7 per cent between 2015 and 2030. GDP growth of more or less than this will have an impact on the resulting trajectory.

Source: Internal analysis of Department of the Environment and Energy (2016), OCE 2016 Energy Statistics Data Table 8.1 and OCE/BREE 2014 Energy Projections to 2049-50.

[2] Department of Industry, Innovation and Science (2016) *Australian Energy Statistics*, Table B1.

b. Projected impact of measures already under way

The Commonwealth Department of the Environment and Energy has undertaken an initial estimate of progress to date on measures in the NEPP. This indicates that progress has been strong in the first year of the 15 year plan, but further measures will need to be considered to capture opportunities identified in the industry sectors.

Based on modelling undertaken by ClimateWorks Australia in developing the NEPP[3], Figure 3 shows identified energy savings opportunities in 2030 (beyond business as usual) by sector. Current estimates of savings expected from NEPP measures underway are overlaid in blue.

The estimated savings required to achieve the national energy productivity target, if gross domestic product continues to grow by 2.7 per cent per year, is nearly 400 petajoules in energy savings in 2030.

Current impacts by sector include:

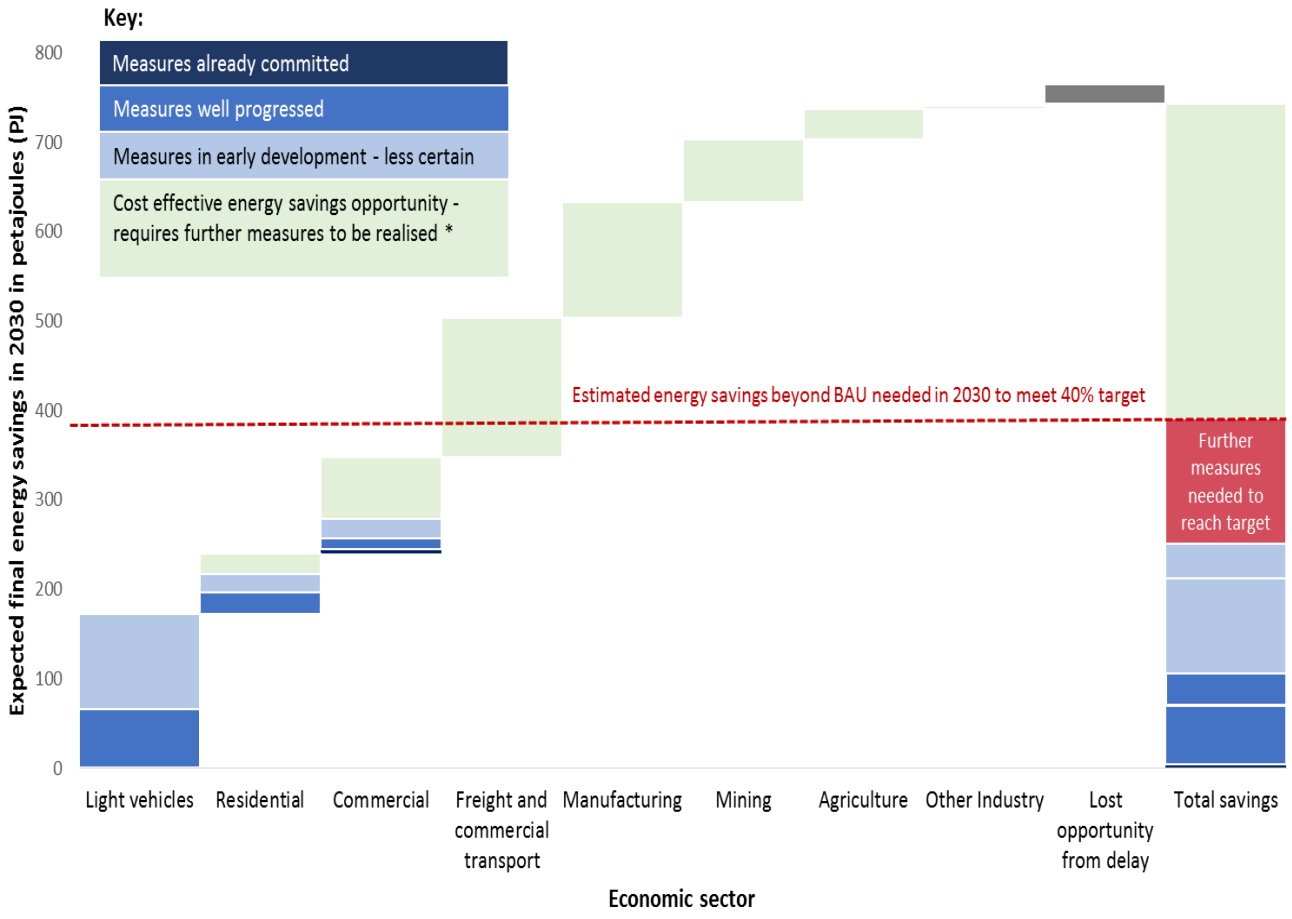
- **Light vehicles** work is well progressed and has potential for very strong impact. But it is not yet certain and the difference between conservative and more ambitious outcomes is large.
- The **residential sector** also shows significant impact, largely due to the estimates from the expanded appliance standards work (see the Highlight: Accelerating the Equipment Energy Efficiency program) and initial work on higher residential building codes. Further identified potential includes retrofits to older residential buildings, which may be encouraged with future development of the residential ratings schemes.
- The **commercial building** sector work also progressed, with the expansion of the Commercial Buildings Disclosure program, commercial appliance standards, and more advanced work on commercial buildings standards. Further potential may exist in retrofits to mid-tier commercial buildings and wider types of commercial buildings beyond offices such as retail, hotels and hospitals.
- The impact in the **industrial sectors and heavy vehicles** is not yet certain. Activities in these sectors in the NEPP are driven largely by voluntary action and while there has been strong activity on sector roadmaps measures remain in early stages of development. This estimate may have missed some impact from measures such as the Emissions Reduction Fund and new funding for innovation. However, in general terms it is clear that further consideration of options in these sectors will be needed to meet objectives.

This analysis only considers policies where *direct* savings of energy can be readily estimated. It does not yet consider the wider economic impacts of policies in the NEPP seeking to reduce the costs of energy, increase relative economic output or improve technologies in the longer term, through measures such as innovation and market competition.

Work will be undertaken in the next year on further metrics for tracking the wider range of NEPP impacts.

[3] Climateworks Australia estimates for the Department of Industry, Innovation and Science, 2015.

Figure 3: Expected impact of NEPP measures progressed to date on 2030 energy savings



** Based on 2015 modelling for the Commonwealth by ClimateWorks Australia that estimated the size of the cost-effective energy savings opportunities in each sector.*

Source: Internal analysis of Department of Industry, Innovation and Science (2016), *Australian Energy Statistics* data tables and energy efficiency modelling by ClimateWorks Australia for the Australian Government.

c. Highlight: Accelerating the Equipment Energy Efficiency program

The Energy Council's Equipment Energy Efficiency (E3) program develops minimum standards and related labels for appliances and equipment, implemented through the Commonwealth's Greenhouse and Energy Minimum Standards (GEMS). The program's Energy Rating Label, which puts a star rating on most white goods, is one of the most recognised energy efficiency measures in Australia.

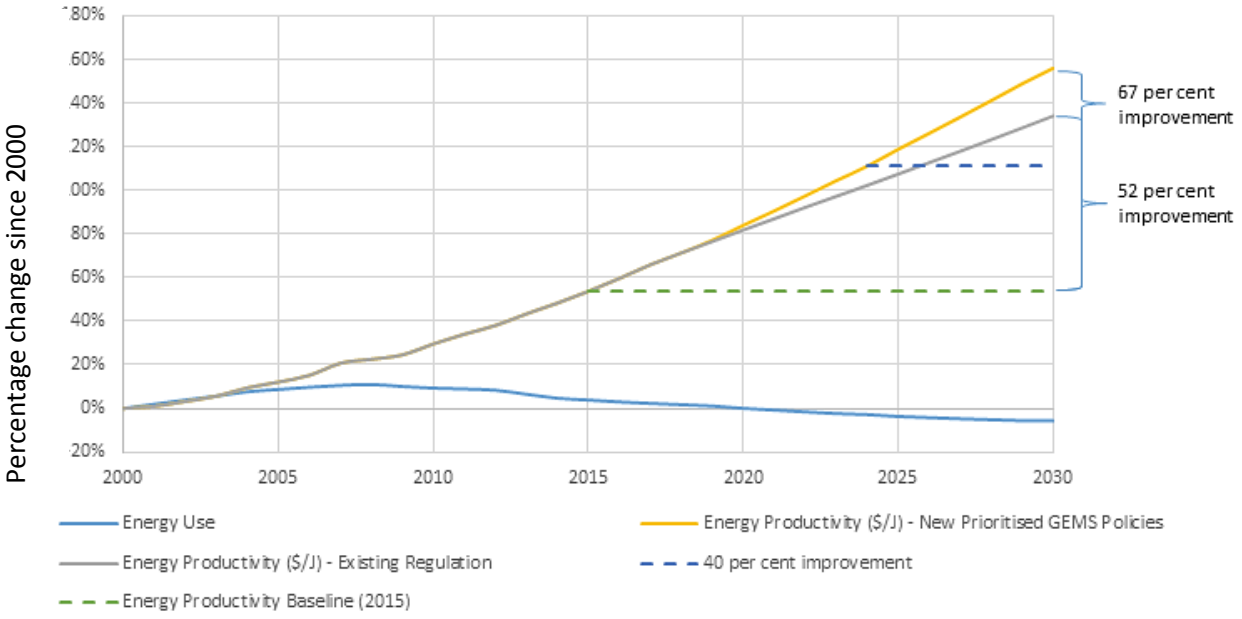
This program has been in operation in various forms since before 2000 and is already making a significant contribution to improving energy productivity in homes all across the country. For example, modern fridges may be much bigger than their 1990s counterparts, but they use less than a third of the power. Improvement rates for minimum standards are strong across appliances, so households improve productivity most of the time when they replace an appliance. The labels can help them choose the most energy efficient appliances available.

Figure 4 shows how household have dramatically improved energy productivity, with an almost 60 per cent improvement over the past 15 years and an expected 52 per cent improvement over the next 15 years even under current energy efficiency standards.

Current work to accelerate this program's impact under the prioritisation plan has been estimated to increase this improvement by a further 15 per cent to around 67 per cent from 2015 to 2030. This means households have been contributing, and will likely continue to contribute, more to energy productivity objectives than other sectors.

These improvements turn into real benefits. New standards proposed in the prioritisation plan are estimated to save consumers up to hundreds of dollars a year.

Figure 4: Household energy productivity improvement 2000–2030



Source: Internal analysis of Department of the Environment and Energy (2016), *Residential Baseline Study (2015) and E3 Regulation Impact Statements (2016)*.

5. Challenges and opportunities ahead

While work under the NEPP has progressed rapidly during 2016, there are still challenges ahead in ensuring Australia's stays on track in its objectives. Overall the most significant challenges and opportunities are:

1. **Driving improvement in the business sector**
   - It will be difficult to meet the target for 40 per cent improvement in energy productivity by 2030 without further support for improvements in the business sector.
   - Work to develop new measures should consider input from the 2xEP sectoral roadmaps, potential programs under ARENA and new research on business performance, as well as wider climate change policy.
2. **Introduction of demand management services**
   - The effective introduction of demand management services, including through the introduction of cost-reflective pricing and smart meters, will be important in ensuring consumers receive the benefits of improving energy productivity and emerging technologies in the sector.
   - Several NEPP measures are considering how to support consumers and service providers in the uptake of these measures. This work will be needed in a timely manner and will be linked to making choice easier and wider considerations around improving data and transparency in the market.
3. **Considering recommendations of key reviews**
   - In 2017, a number of reviews will consider the effectiveness of frameworks in the energy and climate change sectors. These reviews could have important implications for energy productivity. They include:
     - The Commonwealth review of Australia's climate change policies to ensure they remain effective in achieving the 2030 climate target. The NEPP is a strong contributor to low-cost carbon abatement and has been estimated to deliver around a quarter of the new abatement required.
     - The NEM (Finkel) review to take stock of the current state of the reliability and security of the National Electricity Market, and provide advice to governments on a coordinated, national reform blueprint.