Final Agenda

“Economic Recovery through Energy Efficiency”

APEC Expert Group on Energy Efficiency and Conservation Meeting (EGEE&C) 55th meeting

Location: (virtual/online) Hong Kong, China
Date: November 18, 2020
Time: 09:00 – 11:00 and 15:00 – 17:00
(Hong Kong, China time – GMT+8)

Part 1 - Energy Efficiency Programs and its Role in Supporting Economic Growth
(Theme – Energy Sectors)
Morning Session / 09:00 – 11:00

09:00 to 09:05 Introduction by Moderator (Tali Trigg)
09:05 to 09:10 Opening Remarks by Kei Ming Barry Chu, Assistant Director, Electrical and Mechanical Services Department, Hong Kong, China
09:10 to 09:15 (virtual) Group photo [poll question #1]
09:15 to 09:20 Energy Efficiency Context by APERC (Hugh Marshall-Tate)

Keynote Address:

09:20 to 09:35 “The Role of Industrial Energy Efficiency in Economic Recovery and Green Growth”
Hiroyuki Tezuka, Fellow, JFE Steel Corporation

09:35 to 09:45 Q&A from participants
Examples of successful programmes from that delivered tangible energy efficiency and economic benefits (5 minutes per sector):

- Peter Graham, Executive Director, Global Buildings Performance Network
- Nuwong Chollacoop, Renewable Energy and Energy Efficiency Research Team Leader, ENTEC, Thailand
- Steve Heinen, Manager of Energy System Analytics, Vector, New Zealand

09:45 to 10:00 Moderated discussion between the four presenters [poll question #2]
10:00 to 10:20 Q&A from participants
10:50 to 11:00 Summary by Moderator [poll question #3]

Part 2 - Energy Efficiency Programs and its Role in Supporting Economic Growth
(Theme – Evaluating Energy Efficiency Programmes)
Afternoon Session / 15:00 – 17:00

15:00 to 15:10 Introduction by Moderator (Tali Trigg)
15:10 to 15:15  Energy Efficiency Context by APERC (Hugh Marshall-Tate)

**Keynote Address:**

“Recover Better with Sustainable Energy in Southeast Asia: A Case for Energy Efficiency”

**Presentation of recently released Sustainable Energy for All (SEforALL) report by Alvin Jose, Senior Energy Specialist**

15:15 to 15:30  Q&A from participants

15:30 to 15:40  Examples of successful programmes from that delivered tangible energy efficiency and economic benefits (5 minutes per speaker):

- **Nurzat Myrsalieva**, Coordinator of Industrial Energy Accelerator at United Nations Industrial Development Organization (UNIDO)
- **Alexander Mastrovito**, Head of Sustainability Asia-Pacific, Scania
- **Nina Campbell**, Energy Efficiency & Conservation Authority (EECA), New Zealand

15:40 to 15:55  Moderated discussion between the four presenters [poll question #2]

15:55 to 16:15  Q&A from participants

16:15 to 16:45  Summary by Moderator [poll question #3]

16:45 to 17:00  Closing Remarks by EGEE&C Chair Ek Chin Vy
Energy efficiency policy workshop

Economic recovery through energy efficiency

Hong Kong, China. 18 November 2020
Hugh MASHALL-TATE Researcher, APERC
APERC was established in Tokyo in 1996 after the Osaka APEC leaders meeting in 1995. Primary objective is to foster a common understanding of energy challenges facing APEC member economies.

Through analysis of:

– The supply and demand outlook.
– Energy markets.
– Policy responses.
Peer Review on Energy Efficiency

• Initiated by APEC Energy Ministers’ 2007 Darwin Declaration.

• Broad review of energy efficiency policies of a volunteer APEC economy carried out by a Review Team of experts to provide recommendations on potential improvements.

• Contributes towards and achieving the shared Apec energy intensity reduction goal of 45% by 2035

• PREE has been hosted by 11 economies:
  o Chile, New Zealand, Viet Nam, Thailand, Chinese Taipei, Peru, Malaysia, Indonesia, The Philippines, Brunei Darussalam and Mexico.

  ▪ Follow-up PREE hosted by five economies:
    ▪ Viet Nam, The Philippines, Thailand, Malaysia and Peru.
Energy Efficiency Policy Workshop

- Part of the APEC peer review on energy efficiency program
- Held in conjunction with EGEEC every year
- Designed to share PREE outcomes with a wider array of stakeholders
- Previous topics have included
  - Government and donor funding mechanisms
  - Policy and program evaluation
  - Conformity Assessment
  - Fuel Economy Regulations
The International Monetary Fund projects that APEC members’ gross domestic products (GDP) will shrink by an average of 3.2% in 2020.
Energy Sectors

1. Industry
2. Buildings
3. Transport
4. Power
Evaluation

1. We are able to benchmark progress by following up previous PREEs.
2. Facilitates interagency communication by bringing all stakeholders together.
3. A focus on data.
Thank you

https://aperc.or.jp/publications/reports/pree.php
The Role of Industrial Energy Efficiency in Economic Recovery & Green Growth

Hiroyuki Tezuka
Fellow
JFE Steel Corporation
Technological solution is the key to reconcile economic recovery and emission reduction (Green Growth).

Kaya-Identity

CO2 Emission = \( \frac{\text{Energy Consumption}}{\text{GDP}} \times \frac{\text{Energy Consumption}}{\text{Energy Consumption}} \times \frac{\text{Carbon Intensity to Energy}}{\text{GDP}} \)

Recovery & Green Growth

BAT dissemination & Technology Innovation
JISF’s International Corporation on EE

Partner

China (2005〜)

India (2011〜)

ASEAN (2014〜)

Cooperation Program

- Steel Plant Diagnosis
- Technologies Customized List
- Public and Private Meeting

*this slide has been edited for compliance with Apec publishing guidelines*
India

Public members and observers
Ministry of Steel
Bureau of Energy Efficiency etc.

Private members and observers
Indian steel companies
(SAIL, RINL, TSL, JSW, JSPL, BSPL, BSL, Essar, MECON etc.)

Japan

Public members
Ministry of Economy, Trade and Industry
Note: Following organizations attend the meeting with specific theme
NEDO / JBIC / JETRO

Private members and observers
The Japan Iron and Steel Federation
(Nippon Steel, JFE steel, Kobe steel, Nisshin Steel etc.)

*this slide has been edited for compliance with Apec publishing guidelines
1. The benefit of technology implementation is demonstrated
   - *Indicate CO₂ reduction effect and payback period* for the collaborative country or region, based on country-based energy prices, plant installation cost and CO₂ emission factor.

2. Technologies listed on TCL are reliable
   - *Effects of the technologies are proven* through Japanese steelmakers’ operating experiences.

3. Easy to reach out to further information when necessary
   - *Include in contact detail of supplier companies which have the best available technologies*.

Please find latest TCL from the link below (For India and ASEAN)
Benchmarking Energy Consumption & GHG Emissions of Iron & Steel Industries of Thailand

*Climate Technology Centre & Network (CTCN) Project (2017)*

1. **Understand the baseline performance:** Designing specific questionnaires for different segments of Thailand iron & steel industry

2. **Detailed survey:** Undertaking Field Survey and Off-site Survey on energy consumption data

3. **Benchmarking of energy consumption pattern,** together with
   - Assessment of Financing Options
   - Training for Iron and Steel Institute of Thailand for data collection & analysis

*Now the Thai steel industry conducts benchmarking once every two years, based on the energy/CO₂ benchmarking system developed under CTCN project*
## JFE Group’s Medium-to-long-term vision

### 【JFE Group’s targets for reducing CO₂ emissions】

#### Toward 2030

- In the steel business, which accounts for most of the JFE Group’s CO₂ emissions, we are exploring feasible scenarios with the aim of reducing CO₂ emissions in fiscal 2030 by 20% or more compared to fiscal 2013, maximizing the use of the **best available technologies and innovations**.

#### Toward 2050

- In line with the social transformation to establish carbon-free infrastructure over the long term, JFE will strive to be **carbon neutral within the JFE Group as soon as possible after 2050**.
- JFE is carrying out **research and development** to be ready to show a **lineup of carbon neutral technologies** in its business processes well ahead of 2050.
Key Messages

- **Energy Efficiency improvement** is the key for post COVID19 Economic Recovery to be matched with Green Growth

- **Applying BATs** is the most proven/effective/quick approach

- **International Corporation** under Public Private Partnership can play an important role

- In the long-term, **Technology Development and Innovation** is necessary to expand the pool of BATs
Thank you
Buildings Sector: 
Supporting Economic Recovery through Energy Efficiency

APEC Expert Group on Energy Efficiency and Conservation Meeting 
18th November 2020

Dr. Peter Graham Executive Director, GBPN
Key Points

**CONTEXT:** APEC & ASEAN Aggregate Buildings Efficiency & Economic Benefits are Globally Significant

**POLICIES WORK:** Evidence shows that Ambitious Policy Settings Support Economic Recovery

**CHALLENGES & OPPORTUNITIES:** Can be aggregated across APEC & ASEAN with common approaches.
CONTEXT
Key Priority: Decarbonizing Housing in Non-OECD Asia

Despite improvements in energy efficiency in the past decade, the buildings sector overall is not decarbonizing. Increasing prosperity is driving demand for increased floor area and energy consumption, faster than the rate of energy-efficiency improvements. In response to this challenge more than 135 countries, thousands of municipalities, and businesses have specifically mentioned action required by the building sector in their public climate commitments to mitigate and adapt to climate change. To succeed all jurisdictions must implement sustainable buildings policies that attract the necessary investment to drive the transformation to low-carbon construction and real-estate markets.

Building energy codes are the foundation of such policy packages because they work to reduce energy demand and associated emissions, improve health, stimulate investment, and create jobs. Despite increased awareness of these benefits, as of 2017 only 62 of 197 countries had implemented some kind of building energy code. Existing code provisions also apply to only about 47% of the building sector's annual global energy-related CO2 emissions leaving about 2.6 GtCO2e/yr un-regulated. An additional 40 countries have pledged to implement a building energy code in their Nationally Determined Contributions accounting for another 13% (0.64GtCO2/yr) of energy-related emissions, bringing the potential regulated building sector emissions up to 60% of total annual CO2 emissions. This still leaves nearly 2 GtCO2e/yr of potential CO2 mitigation potential being missed. To achieve this potential national and sub-national governments need support to extend the coverage of sustainable buildings policies and build the administrative and technical capabilities to adopt and implement them. Asian and S.E. Asian markets where floor area and energy demand for space cooling is increasing rapidly, and building energy demand remains poorly regulated should be the first focus.

New Construction

Over the next 4 decades building floor area is projected to grow by 280 billion m² (over 3 trillion sq.ft). After demolition rates are factored in this equates to adding an average of 6.5 billion m² (70 billion sq.ft) of new floor area annually – equivalent to constructing the entire building stock of Japan every year from now until 2060 (IEA, 2017). The majority of this growth in new floor area will occur in non-OECD Asia (India and S.E. Asia) and China, then Africa (after 2030) (Fig. 1).

Source: GABC, 2018
POLICIES WORK
ADOPTING DECARBONIZATION POLICIES IN THE BUILDINGS & CONSTRUCTION SECTOR — COSTS AND BENEFITS

2. COST-EFFECTIVE POLICIES

It is difficult to compare the efficacy and cost-efficiency of policy strategies between jurisdictions due to the large variation in market complexity, building type, construction activity, socio-economic and cultural impacts of energy use, as well as the variety of policy impact methodologies employed. However, it is important to establish a definition of cost-efficiency in building energy and climate policies.

Designing and implementing any policy generates costs and benefits. The most cost-effective policies deliver high-impact with the least monetary costs over a given period. However, there are multiple costs and benefits that need to be considered and factored in to a calculation of cost-effectiveness.

According to the International Energy Agency (IEA) the costs can be determined as the additional incremental spending required to meet new energy performance requirements compared with the cost of achieving previous energy performance levels. Costs and benefits of building energy policies also need to be evaluated against a base case, which may be either continuing with no policy, or continuing with no changes to current policy. The overall direct cost of a policy intervention is normally calculated as a function of the additional costs incurred by all affected stakeholders, including public authorities, policy implementers, and end-users compared to business as usual. These can either be one-time costs, or a sum of repeated investments, discounted over the lifetime of a policy intervention. Costs to industry of responding to changes in codes are generally assumed to be passed on to consumers. The monetary benefits of a policy are normally calculated as a function of the monetary value of energy saved by the policy over its lifetime. The magnitude of the net benefit is strongly influenced by new construction activity and renovation rates.

However, costs and benefits of promoting low-carbon and energy efficient buildings accrue to different stakeholders at different times during the building life-cycle (Table 1). For example, a major concern for policy makers is to raise performance requirements of codes for new construction and renovation without substantially increasing upfront design or construction costs. This is often complicated by sensitivity in the market about perceived high up-front costs, and a lack of trust in the realisation of projected benefits.

Determining the cost-effectiveness of a policy is therefore both a technical and political calculation. This is because benefits accrue over periods that are often longer than election cycles, and because the construction and real-estate industries often over-estimate the costs of increasing the energy performance and reducing the carbon footprint of buildings, and under-estimate the financial benefits. Many of the financial benefits do not accrue directly to building developers and constructors, but rather to building occupants, creating a split incentive.

Policy works - Post Covid 19 Economic Recovery

Non-Climate Drivers

Ambitious Building Codes + Rating & Disclosure + Appliance Standards & EEOs

Integrated Policy Packages

Performance & Renovation targets
Benefits of Energy Efficiency Codes

**EU**
Saved 35 – 45MtCO₂
2010-2011

**US**
Saved 106 Million toe
1992-2012

**CHINA**
Beijing Saved 1585Mtce
2011-2015

**UGANDA**
Uganda BEE Policies
Electricity for
8 Million People
## Benefits of Renovation Policies

<table>
<thead>
<tr>
<th>Set targets &amp; obligations</th>
<th>EU</th>
<th>20% improvement: +€33.8bn GDP by 2020; Deep renovation: &gt; €1300bn +1.1M jobs by 2050.</th>
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</thead>
<tbody>
<tr>
<td>Apply the energy code</td>
<td>China</td>
<td>~ 150Mtce reduced By applying the energy code to renovation in Beijing</td>
</tr>
<tr>
<td>Provide grants for deeper renovation</td>
<td>Germany</td>
<td>KfW Grants +8450 jobs: accrued benefit of €10 billion (2007-2012)</td>
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<tr>
<td>Mandate rating &amp; disclosure</td>
<td>Australia</td>
<td>NABERS: saved 35% energy &amp; 42% in emissions since 2000.</td>
</tr>
<tr>
<td>Price carbon emissions</td>
<td>Japan</td>
<td>Tokyo Cap &amp; Trade reduced emissions by 14MtCO₂ (2010-2014)</td>
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Economic Benefits

**GDP** + Policy ambition leads to +ve ROI to Public Finances over time.. (e.g. direct and co-benefits of energy efficiency measures have the potential to add 1% growth in GDP in Germany.

Higher performance leads to lower home operating costs. (e.g. EE measures to eliminate fuel poverty in 2.5 million homes in the UK provided a net economic benefit of UK1.2Bn in 2008)

Each US$1M invested in EEBs creates about 14 job-years of net employment. Productivity of the construction value chain also improves.

Direct health benefits are between 8%-22% of value of energy savings (e.g. In EU up to EU2.86Bn health savings by 2020; Indirect benefits include better physical & mental health. Improving thermal comfort in homes is a priority.
CHALLENGES & OPPORTUNITIES
Policy Strategy

HOW CODES ENABLE MARKET TRANSFORMATION

Learning from Local experience and best practices

MINIMUM PERFORMANCE

BEST PRACTICE

STICKS

CARROTS

TAMBOURINES

> CODES
> REGULATIONS

> REBATES
> GREEN LOANS
> COM ETC.

> VOLUNTARY RATING
> CAPACITY BUILDING
> AWARENESS RISING

BASE-LINES

ILLEGAL

INNOVATION

Supporting Regulatory Reform + Driving Demand... Health, Jobs & Economic Opportunity in local housing markets
Code Implementation a Challenge

Building Codes & Standards lack coverage & enforcement

But voluntary green building standards are commonly available …

Source: APEC GBPN, 2017
Common Standards

Include Embodied Emissions from Bricks, Cement & Steel

Increase scope of Policy Impact including refurbishment, rating & disclosure, Economic & Health Benefits

Promote Zero Life-cycle Emissions Building through design innovation

Materials Standards  Rating & Disclosure  Codes  Low-Carbon Finance
Towards a zero-emissions, efficient and resilient buildings and construction sector

Key message • Most current NDCs do not explicitly cover buildings sector emissions.

Buildings sector emissions coverage in NDCs, 2018-19

2019 Global Status Report for Buildings and Construction

Notes: Emissions coverage is estimated based on specific mentions of measures related to the buildings sector, building end uses and technology with respect to 2018 buildings sector CO2 emissions. Country NDCs that do not explicitly mention measures or actions for

NDCs submitted in 2018-19 focus on improving building performance codes and standards, fuel consumption. Additional efforts on waste management, solvent emissions, and new technologies have been made to 20% below the 2005 level by 2030. Since 2008, San Marino has deployed environmental policies to improve buildings sector energy efficiency, promote renewable energy through solar photovoltaic (PV) and reduce energy mitigation measures for the energy, industrial processes and waste sectors, including promoting energy efficiency and reducing the use of HCFCs (hydrochlorofluorocarbons) in foam and refrigeration. Oman has also requested special support for funding, capacity-building and technology transfer to effect further action on sustainable interest in improving energy efficiency in buildings, for example the economy-wide targets in the European Union, have not been counted in emissions coverage.

Despite contributing only 0.00052% of global emissions, San Marino has committed to reduce its GHG emissions to 2% during 2020-30. The government plans to adopt various mitigation measures for the energy, industrial processes and waste sectors, including promoting energy efficiency Oman intends to reduce its GHG emissions by 2% during 2020-30. The government plans to adopt various mitigation measures for the energy, industrial processes and waste sectors, including promoting energy efficiency

Green Buildings
Climate Bonds
Government & Community Mitigation Goals
Climate Bonds
Building Codes & Climate Policies

Non-Compliant NDCs

Roof-top PV & Design for climate

GBPN
Global Buildings Performance Network
Building Policies for a Better World

IEA (2019). All rights reserved.
Align with Adaptation & Resilience – Buildings sector actions

Adaptation Actions in the Building Sector among Asia-Pacific Nations in NDCs & NAPs

Source: Yusuf & Francisco, 2009
Electrification: Clean Energy or Emissions Driver

Indonesia #1 in Growth in cooling-related electricity demand

Thailand & Vietnam #1 & 2 in Growth Electrification

Passive & Adaptive Cooling

Integrated Renewables

Source: IEA, 2018

Source: IEA, 2017

Source: IEA, 2018

Source: IEA, 2017

CEPT University, 2020
Challenges & Opportunities

AGGREGATE APEC and ASEAN BENEFITS with:

• COMMON Goals and Performance Standards
• COORDINATED Stakeholder Engagement Process and platforms
• INTEGRATED Implementation between national, provincial and municipal governments + Private Sector and Community Engagement
Thankyou!

More information:

www.gbpn.org

Peter.Graham@gbpn.org
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<th><strong>APEC</strong></th>
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<tr>
<td><strong>Expert Group on Energy Efficiency and Conservation (EGEEC)</strong></td>
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<tr>
<td>Projects on buildings efficiency including topics: Cool roofs, APEC Nearly/Net Zero Building Roadmap</td>
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<tr>
<th><strong>Asia-Pacific Building Codes Forum</strong></th>
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<th><strong>ASEAN</strong></th>
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<tr>
<td><strong>ASEAN Centre for Energy (ACE)</strong></td>
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<tr>
<th><strong>ASEAN Climate Change and Energy Project (ACCEPT)</strong></th>
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<tr>
<td>Country snapshots &amp; Policy Briefs</td>
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<tr>
<th><strong>ASEAN Building and Construction Working Group</strong></th>
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<th><strong>Global Buildings Performance Network</strong></th>
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<th><strong>Global Alliance on Buildings &amp;Construction</strong></th>
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<td>Supporting development of regional sustainable buildings roadmaps.</td>
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Examples of successful programs from that delivered tangible energy efficiency and economic benefits: Transport

APEC Energy Efficiency Policy Workshop [EWG 07 2019A]: 18 Nov 2020 [online]

Nuwong Chollacoop
Renewable Energy and Energy Efficiency Team Leader
National Energy Technology Center [ENTEC]
nuwong.cho@entec.or.th
New R&D Center focusing on Energy Technology after 1\textsuperscript{st} October 2020
Past economic boost through EE in transport

• Eco-car phase I & II [5 & 4.2 Lge/100km fuel economy criteria]
  ✓ First car scheme [reduced excise tax for first-time car buyer including eco-car]
• CO₂-based excise tax through eco-sticker program boost more EE car

Dec 2012: Cabinet announced CO₂-based excise tax to be implemented on 1 Jan 2016
Current economic boost through EE in transport

- Electrified vehicle [BEV/PHEV/HEV, e2&3w]

Currently (August 2020)
20 companies participating in the labeling program
19 models / 11,750 cars of Electric Motorcycle Label no.5

**EXCISE TAX FOR ECO-CAR AND ELECTRIC VEHICLES**

<table>
<thead>
<tr>
<th>Vehicle type</th>
<th>CO2 emission (g/km)</th>
<th>Tax rate (effective from Mar 16–2017)</th>
<th>Tax rate (.linkedin)</th>
<th>% change</th>
<th>% share</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eco-car One (2007)</td>
<td>Below 120</td>
<td>14%</td>
<td>N/A</td>
<td>N/A</td>
<td>56.6%</td>
</tr>
<tr>
<td>Eco-car Two (2013)</td>
<td>Below 100</td>
<td>12%</td>
<td>N/A</td>
<td>N/A</td>
<td>44.75%</td>
</tr>
<tr>
<td>Below 100 with EES</td>
<td>10%</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>33.33%</td>
</tr>
<tr>
<td>Hybrid and Plug-in Hybrid EV</td>
<td>Below 100</td>
<td>6%</td>
<td>N/A</td>
<td>N/A</td>
<td>12%</td>
</tr>
<tr>
<td>101-120</td>
<td>10%</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>10%</td>
</tr>
<tr>
<td>121-150</td>
<td>10%</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>8%</td>
</tr>
<tr>
<td>151-200</td>
<td>10%</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>7%</td>
</tr>
<tr>
<td>Above 200</td>
<td>26%</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>6%</td>
</tr>
<tr>
<td>Total</td>
<td>156,293</td>
<td>209,522</td>
<td>34.10%</td>
<td>100.00%</td>
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**LIST OF MANUFACTURERS GRANTED BOI’s EV INCENTIVES**

<table>
<thead>
<tr>
<th>Hybrid EV</th>
<th>Plug-in hybrid EV</th>
<th>Battery EV</th>
<th>Lithium-ion battery</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toyota (19.02 billion baht)</td>
<td>Mercedes-Benz (607 million baht)</td>
<td>FOMM (716 million baht)</td>
<td>Beta Energy Solution (1.1 billion baht)</td>
</tr>
<tr>
<td>Nissan (10.96 billion baht)</td>
<td>BMW Group (705 million baht)</td>
<td></td>
<td>Thonburi Energy Storage Manufacturing (600 million baht)</td>
</tr>
<tr>
<td>Honda (5.82 billion baht)</td>
<td>SAIC Motor-CP (1.36 billion baht)</td>
<td></td>
<td>Energy Absolute (2 billion baht)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Global Power Synergy (1.48 billion baht)</td>
</tr>
</tbody>
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**Tentative plans from manufacturers**

- Hybrid EV
  - Mazda
  - Suzuki

- Plug-in hybrid EV
  - Mitsubishi

- Battery EV
  - Mine Mobility Research

**Source:** Bangkok Post, EGAT
Impact of COVID-19 on auto industry

- Recovery in progress through new business
  - Government procurement is the key

Source: TAI
APEC Workshop - 18th November 2020
Economic Recovery through Energy Efficiency
Dr Steve Heinen, Vector, New Zealand
Vector Ltd is New Zealand’s largest energy portfolio business

- Majority owned by our community via Entrust and operates in NZ, Australia and the Pacific
- Ownership model creates natural alignment between customer and shareholder benefits
- Listed on the New Zealand stock exchange, with a market capitalisation of $4.4b

[Diagram showing the distribution of services: 60% regulated and 40% unregulated]
Customer-side transformation requires new modelling and analytics

Major trends are redefining the customer-side of the electricity system connected to LV networks:

- Energy efficiency (i.e. flat or decreasing demand growth)
- New technologies (EVs, solar PV, smart homes, heat pumps, etc.)
- Changing behaviour (e.g. environmental concern and decarbonisation)

The LV network and customer analysis have historically been modelled and monitored with less detail, but need to be incorporated in network planning to achieve better long-term outcomes for customers in terms of cost, efficiency and decarbonisation.
Symphony Modelling Unleashes Customer-centricity

In an era of rapid technology and behaviour change, customer-centricity should guide electricity network strategy and planning.

Vector’s granular bottom up customer model enables a customer-centric and data-rich approach to planning and strategy.

This delivers effective risk-based infrastructure planning, pricing and policies which recognise and account for diversity of customers and future uncertainty.

Vector’s unique customer-centric modelling approach has been recognised internationally and recently published in ‘The Electricity Journal’. The model was also nominated for network initiative of the year in the NZ Deloitte Energy Awards 2019.

Free access until mid November with following link
https://authors.elsevier.com/a/1bqaX3ic--3JFd
Granular Residential Energy Efficiency Potential

Each zone represents roughly 1000 homes.
Vector AWS Strategic Alliance

New Energy Platform
Next generation advanced metering and market enablement platform
Key Messages

Network planning needs to be flipped to a bottom-up approach to put the customer at centre.

Unprecedented energy efficiency success over last decade made that clear.

Smart meter data is essential to understand changing demand side and provide new robust planning inputs.

Non-wire alternatives and DERMS are available but need the right frameworks and tools.
Recover Better with Sustainable Energy in Southeast Asia: A case for Energy Efficiency

APEC Expert Group on Energy Efficiency and Conservation Meeting (EGEE&C) 55th meeting

Alvin Jose
Senior Energy Specialist
Sustainable Energy for All
18 October 2020
Covid-19 has put Global and Asian Economies into worst contraction ever

- Per IMF, Growth in Asia is expected to stall in 2020, which is the worst performance in last 60 years.
- North East Asia, ASEAN and the Pacific economic growth is expected to be limited to 0.5%.
- Emerging Markets and Developing Economies (EMDE) in Asia would/will experience severe economic contraction, and countries depending on tourism, oil/energy exports, SMEs and deep global value chains would experience most impacts.
- EMDE’s in Asia are also consumption heavy economies and slowdown in demand has resulted in reduced manufacturing activity and household incomes.

SDG-7 by 2030 Progress – Key trends

Tracking SDG7: The Energy Progress Report 2020

Covid-19 has impacted SDG-7 progress, but this is our reset moment. We can recover better.

The renewable energy opportunity is still to be fully realized.

We can no longer ignore the clean cooking crisis.

Energy inefficiency is costing us.

Electricity access is growing, but not for everyone.
Southeast Asia has considerably improved access to electricity but there are ~789 million people in the world without access to electricity.

Significant progress on electrification has been made since 2010, with the number of unelectrified people falling from 1.2 billion to 789 million in 2018.

The decline was most significant in Asia, where the deficit shrunk from 548 million in 2010 to 218 million in 2018, but in Africa the situation is basically stagnant.

Southeast Asia has made excellent strides in electricity access, however, there are ~218 million people without access to clean cooking.

Population in Southeast Asian countries without access to clean cooking (million)

- Philippines, 57.592
- Indonesia, 53.533
- Myanmar, 38.670
- Vietnam, 34.395
- Cambodia, 12.675
- Thailand, 14.580
- Lao PDR, 7.018

SOURCE: SDG-7 Tracking Report 2020. This graph shows only countries that have clean cooking access lower than 95%.
Energy Efficiency is the “first” and “cheapest” fuel than needs to be capitalized in SE Asia

- There is still a lot of untapped EE potential in Asia that remains to be unlocked.
- Malaysia, Thailand and Vietnam have sustained their progress, while Indonesia and Philippines have slowed their progress.
- Brunei, Lao PDR, Myanmar and Singapore have significantly increased their energy intensity.

Asia has the fastest growing economy and energy demand in the world

• Asia is the global growth story with energy required to sustain its development efforts and meet its development potential.

• Energy Efficiency is the cheapest fuel that can power businesses towards higher competitiveness and strengthen resilience.

Source: 2020 SDG7 Tracking Report
Low Hanging Fruit: Sustainable Cooling provides significant opportunities for addressing Equity and Energy Efficiency in Asia

Cooling Access: Populations at Risk in Asia

Rural Poor: Approximately 109 Million
Urban Poor: Approximately 484 Million
Lower-middle Income: Approximately 1.8 Billion

Cooling Access issues for Health and Productivity

- USD 630 billion of annual economic loss due to heat stress and 59 million full-time jobs lost in Asia.
- As the world develops vaccines to prevent future pandemics, access to cold chains remains essential for safely storing and transporting vaccines.
- By 2050, around 2/3 of the world’s households could have an air conditioner. China, India and Indonesia will together account for half of the total number.
- Without addressing energy efficiency, energy demand for space cooling will more than triple by 2050 – consuming as much electricity as all of China and India today.

Source: SEforALL Chilling Prospects 2020, IEA
Southeast Asia a demand hub for cooling: need to ensure sustainable cooling access

Southeast is expected to have high AC uptake

- Annual demand of 300 million units expected by 2040. Indonesia will be the major market for the AC demand in SE Asia.
- The cooling sector in Southeast Asia has significant importance and will be expected to account for 30% of the peak power demand by 2030.

Rising Middle income and Lower middle-income levels in SE Asia

- In 2018, more than 100 million middle income and 250 million lower middle-income population in SE Asia with lack of access to sustainable cooling.
- Risk of cheap and inefficient cooling solutions to be adopted by these population.

Source: SEforALL Chilling Prospects 2020, IEA
Amidst the pandemic and ongoing recovery efforts, there are opportunities to reset economies and adjust structures of development and competitiveness.

**The environment we face**
- Increased illness and mortality (from COVID-19 and other ailments)
- Prolonged economic contractions and reduced output
- High levels of joblessness

**How to recover better with Sustainable energy for all**
- Rolling out economic stimulus measures and welfare programs
- Investing in new technologies, businesses, and systems
- Rethinking post-COVID economies and societies

This sustainable energy guide highlights the opportunities, benefits and enablers which will help leaders guide their countries onto a more sustainable long-term development trajectory.
Prioritizing sustainable energy will provide economic, employment, commercial, health, and gender benefits to Southeast Asia governments and their citizens.
Promoting investments to sustainable energy can bring added value to the economy while quickly closing access gaps.

- It is estimated that a **USD 400 billion energy efficiency investment potential** in Southeast Asia yet to be realized, out of which USD 152 billion represents untapped potential in the buildings sector.

- The **energy efficiency interventions** for existing and new buildings could **create about 2.4 million jobs** in Southeast Asia alone.
Southeast Asia can capture further benefits by promoting regionalization of RE and EE equipment value chains.

**Up-Stream Value Chain**

- **Component Manufacturing/Assembly**
  - Solar Home Systems
  - Panels
  - Turbines/Blades
  - Storage Devices
  - Inverters
  - Wires/Poles

**Up-stream Value Chain for Energy Efficient Appliances**

- Fans/Refrigerators
- LED lighting
- Entertainment/Connectivity
- Machinery

**Goal:** 30% of value chain localized/regionalized

**End - Users**

- Utilities / Power Plants
  - Solar
  - Wind
  - Air

- Distributed Solution Providers
  - Solar
  - Wind
  - Home

- Households and Businesses
  - House
  - Business

Source: Recover Better Guide SE Asia, SEforALL
To capture this opportunity, governments should address eight actions/reform efforts to unlock a recovery driven by sustainable energy.

**Promoting Ease of Doing Business**
- Reducing number and time to obtain permits
- Reducing or eliminating import duties and taxes
- Promote entrepreneurship and cross border trade

**Investing in Energy Efficiency**
- Acknowledging investments in efficiency are the cheapest way to reduce energy demand and GHG emissions.

**Enhancing Policies and Regulatory Frameworks**
- Developing of regulatory frameworks for off-grid and on-grid development
- Empowering of Regulators/Rural Electrification Agencies

**Transitioning to Cost Reflective Tariffs**
- Allowing price for electricity to reflect the actual costs to produce and deliver energy
- Enhancing utility performance and investment attractiveness
- Providing monetary relief for poorer consumers
Eliminating Fossil Fuel Subsidies
- Allowing cost of fuels to reflect market prices
- Creating additional fiscal space in budgets
- Enhancing the competitiveness of renewables

Declaring moratorium on new coal-fired Power
- Recognizing investments in renewables are now cheaper than investments in coal plants in major markets today.
- New investments in coal would make future coal-based power plants stranded assets.

Investing in Data
- Identifying of optimal sights for developments
- Prioritizing of communities for commercial investments in electrification (“productive uses”)
- Integrating energy planning across technologies to determine least cost connections
  Make available data that promotes investment

Investing in People to Ensure Access to Jobs
- Ensuring investment in human capital to take advantage of job creation opportunities
- Building a talent pool needed as local industries are established
- Enhancing capacity of Government institutions
SEforALL.org

SEforALL.org

SustainableEnergyforAll

SEforALL

Alvin Jose: alvin@seforall.org
Accelerating Industrial Energy Efficiency: UNIDO Approach

APEC Workshop on Energy Efficiency Policy

Nurzat Myrsalieva
18 November 2020
Online
The United Nations Industrial Development Organization (UNIDO) is the specialized agency of the United Nations that promotes industrial development for poverty reduction, inclusive globalization and environmental sustainability.

UNIDO’s mission is to promote and accelerate inclusive and sustainable industrial development (ISID) in developing countries and economies in transition.

UNIDO programmatic focus is structured in four strategic priorities:

- Creating shared prosperity
- Advancing economic competitiveness
- Safeguarding the environment
- Strengthening knowledge and institutions
Objectives of the Industrial Energy Efficiency Programme

Work together with counterparts, stakeholders and partners to:

- **Strengthen policy** and regulatory frameworks for better & sustainable energy efficiency performance in industry
- **Accelerate adoption** and wide dissemination of industrial energy efficiency best-available practices & technologies
- **Save energy** and reduce GHG emissions of the industrial sector
- **Integrate energy efficiency** in industry daily business practices for sustainable increased productivity & competitiveness
Industrial Energy Efficiency:

Methodology & Approach:
- Support industries with implementation of EnMS & Industrial EE measures
- Train market actors in implementation of EnMS & Industrial EE measures
- Country-specific case studies, tools & support institutionalization of the training programme

Content of Capacity Building Programme:
- Implementation of ISO 50001 Energy Management System (EnMS)
- Implementation of Energy System Optimization (ESO) measures for:
  - Motor-driven systems (pumps, fans, compressors, motors)
  - Industrial heat (steam systems, process heat, waste heat recovery)
  - Industrial cooling & refrigeration systems
- Integration of Renewable Energy systems for industrial processes;
- Preparation of financially sound investment proposals;
- Corporate GHG Accounting, Verification & Reporting
What we mean by Energy System

Source: W. Perry for UNIDO
UNIDO Global EnMS-ISO 50001 Programme – Jun 2020

Operational in 21 countries
Planned activities in 10+ countries

Projects
- South Africa
- Moldova
- Russia
- Turkey
- Ecuador
- Malaysia
- Thailand
- Viet Nam
- Philippines
- Indonesia
- Egypt
- Iran
- Ukraine
- Colombia
- Myanmar
- India
- Georgia
- North Macedonia
- Morocco
- Cuba
- Nigeria

Other donors
- Swiss State Secretariat for Economic Affairs
- UK Department for International Development
- Government of South Africa
- Government of Italy
- Government of Austria
The Industrial Energy Accelerator is a UNIDO-led global platform to encourage uptake of industrial energy efficiency.
Energy Efficiency Solutions for Industries:

Download the knowledge kits from: www.industrialenergyaccelerator.org
Example 1: Iron and Steel – South Africa

ArcelorMittal Saldanha Works

- Electricity demand: 160 MW
- Manpower: 548 permanent employees
- Sales output: 1,2 million ton HRC/annum

Adjustments/optimization of production operations, energy systems optimization, fuels switching, etc... driven by EnMS!

2012 Energy Savings (Norm.) > 100 GWh

Energy Efficiency Achievements 2011

<table>
<thead>
<tr>
<th>Energy Management System Implemented</th>
</tr>
</thead>
<tbody>
<tr>
<td>No. of Projects/Measures</td>
</tr>
<tr>
<td>Total Capital Investment (USD)</td>
</tr>
<tr>
<td>2011 Gross Financial Savings (USD)</td>
</tr>
<tr>
<td>Overall Payback Period (in years)</td>
</tr>
<tr>
<td>2011 Energy Savings Norm. (GWh)</td>
</tr>
<tr>
<td>2011 GHG Reductions (tons CO₂)</td>
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</tbody>
</table>
# Accelerating Industrial Energy Efficiency: Our Projects

## Egypt

**Major Industries:** Non-metallic minerals sub-sector

**Project:** Accelerating the uptake of energy efficient motors in industry.

**Key Project Targets:**
1. Conductive Policy tools to promote the use of energy efficient Motor Systems
2. 300 end-users, suppliers and experts trained on Energy Efficiency in Motor Driven Systems
3. 20 industrial facilities supported
4. Support 5 energy service providers to provide energy efficiency

**Energy Savings:** 598,000 TONS equivalent of direct GHG emissions and 1.9 million tons of indirect emissions, which is roughly equivalent to the per capita emissions of more than 750 million Egyptians.

**Environmental Impact:** 115,000 MWh by the end of the project, equivalent to electricity consumption of approximately 25,000 households for a year.

## India

**Major Industries:** Iron & steel, textiles & garment production, food value-chain, agriculture

**Project:** Accelerate the growth and deployment of low carbon technology for industrial energy efficiency.

**Project Objective:**
- Accelerate the growth and deployment of low carbon technology for industrial energy efficiency.
- Spark 10 innovation challenges that contribute to the development of at least 120 low carbon intensive innovations.

**Energy Savings:** By far the largest share of energy savings can be made in the agricultural, dairy and cold chain food distribution sectors.

For example, in 2016, India’s outdated agricultural pumps were estimated to consume 170 billion units of energy. A replacement of just 200,000 agriculture pumps with 200,000 BEE star-ranked pump sets is estimated to lead to 30 per cent of energy savings and a cost saving of potentially $3 billion (govt. figures).

## Malaysia

**Major Industries:** Iron & steel, cement, wood, food, glass, pulp & paper, ceramics, rubber, chemicals, plastics and textiles

**Project Objective:** Improving regulations, technical capacity and financial incentives for an accelerated growth of solar thermal energy applications and industrial energy efficiency improvements.

**Energy Savings:**
- 100 MILLION KWH from SOLAR THERMAL
- 11.25 BILLION KWH from THERMAL ENERGY EFFICIENCY, which is equivalent to powering 2.6 million Malaysian households for a year.

## Republic of South Africa

**Major Industries:** Power generation, chemicals and petrochemicals, and paper, machinery building and metal working, forestry, woodworking and wood products, construction materials, agriculture.

**Project:** Accelerating the adoption and mainstreaming of energy management systems (EnMS) energy systems optimization (EnSO) and the Energy Management Standard ISO 50001 series in South African industrial and commercial sectors, supporting strengthened policy and regulatory frameworks, and expanding the capacity of South African industry to implement EnMS and EnSO through skills development and the development of a funding mechanism for energy efficiency projects.

**Energy Savings:** 3.3 BILLION KWH energy savings over 10 years, roughly equivalent to the annual energy consumption of over one million South Africans.

**Environment Impact:** Avoidance of 580,000 TONS of CO2, GHG emissions, roughly equivalent to the per capita GHG emissions of 116,000 South Africans.

**Investment Generation:** $30,000,000

## Ukraine

**Major Industries:** Power generation, chemicals and petrochemicals, and paper, machinery building and metal working, forestry, woodworking and wood products, construction materials, agriculture.

**Project Objective:** Supporting the national introduction and roll-out of the ISO 50001 Energy Management System (EnMS) Standard.

**Feature Project Targets:**
1. At least 18 companies implement Energy Management Systems and are certified to the ISO 50001 standard.
2. 500 energy management system (EnMS) and energy system optimization (EnSO) experts are trained and qualified to support EnMS-ISO 50001 roll-out.
3. 50 financial instruments, which promotes and supports wider implementation of EnMS-ISO 50001 and industrial energy efficiency, is established.

**Energy Savings:** 5.82 BILLION KWH, roughly equivalent to the electricity needed for nearly 18 billion hours of air conditioning.

**Energy Costs Avoided:** $245 MILLION

**Environmental Impact:** Avoidance of 6.8 MILLION TONS of CO2, GHG emission, equivalent to the per capita emissions of more than 600,000 South Africans.

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[Source: UNIDO]
Achievements after 10 years of EnMS implementation

- **650+ EnMS Experts Qualified**
- **Over 3500 Companies Trained in EnMS**
- **More Than 500 Companies** directly supported throughout EnMS Implementation
- **More Than 1,000 Decision Makers, Policy Makers, Financial Authorities, Service Providers and Top Management** directly engaged in training and related initiatives

- **4-15% of Energy Saved** per company in the first year of EnMS implementation with little or no capital investment
- **Cumulative Primary Final Energy Savings** exceed 25,000 GWh
- **More Than $400 Million USD** saved in Cumulative Energy Cost Savings
- **More Than 10 Million Tons of CO₂ Emissions** avoided, roughly equivalent to the carbon sequestered by 150 million 10-year-old trees

Visit: www.industrialenergyaccelerator.org
Scania’s aim is to drive the shift towards a sustainable transport system, creating a world of mobility that is better for business, society and the environment.
SCANNIA’S SCIENCE BASED TARGET

SCOPE 1&2

50% CO₂ reduction from our operations by 2025 (2015)

SCOPE 3

20% CO₂ reduction from our products by 2025 (2015)
OUR APPROACH TO SUSTAINABLE TRANSPORT

Energy efficiency

Alternative fuels and electrification

Smart and safe transport
ENERGY EFFICIENCY

New truck range

Optimised specification

Optimised driving

Optimised maintenance

Average 5% fuel savings

Based on operational analysis

Scania Driver services

Maintenance+
CONNECTED VEHICLES
>70% OF 5 YEAR ROLLING FLEET

Smart and safe transport

363,676
AUTONOMOUS VEHICLES

Smart and safe transport
BUS RAPID TRANSIT

Smart and safe transport
BATTERY ELECTRIC VEHICLES

Alternative fuels and electrification
ELECTRIC ROADS

Alternative fuels and electrification
DRIVING THE SHIFT
TO A SUSTAINABLE TRANSPORT SYSTEM
Economic recovery through energy efficiency

A New Zealand example

Presented by Nina Campbell, Senior Advisor
Energy Efficiency & Conservation Authority of NZ
18 November 2020
New Zealand’s greenhouse gas emissions

Over two thirds of the energy used in New Zealand comes from non-renewable energy sources

Nearly 41% of NZ’s emissions come from the energy sector

Source:
- Greenhouse Gas Inventory 1990-2017, MfE (2019); Light vehicles and Other transport estimates are based on data from the MBIE 2017 energy balances and MBIE Energy in New Zealand (2018)
- MBIE’s 2018 Energy Balance Tables, electricity statistics and Energy in New Zealand (2016)
Stimulus funding in the energy sector

- Decarbonising industrial process heat
- Low emission vehicles contestable fund
- State sector decarbonisation
- Five ‘shovel ready’ infrastructure projects:
  - Invercargill Renewable District Heating System (100% funded)
  - Electric and Hydrogen-ready Hybrid Ferries (45% funded)
  - Minimum Viable Hydrogen Refuelling network (30% funded)
  - Thermal Sludge-Drying Facility Replacement (76% funded)
  - Energy Hardship Alleviation – Housing energy efficiency (38% funded)
- Warmer Kiwi Homes expansion (90% co-funding)
- Distributed energy for public and Māori housing
- Energy hardship work programme
Stimulus investment principles

Applying a wellbeing approach to investment and decision-making.

- **Maximising impact**: demonstrate a significant contribution to:
  i) decarbonisation; ii) supporting employment and economic activity; and iii) improving wellbeing, especially among low-income groups.

- **Encouraging innovation**: support early adopters of technologies that demonstrate wide replication and emissions abatement potential but may carry increased technological risk or uncertainty.

- **Leveraging co-funding**: maximise number of projects by leveraging co-funding opportunities and existing funding mechanisms

- **Implementation-readiness**: projects must be implementation-ready

- **Additionality**: projects that are unlikely to be implemented in the short term without government support.
Example:
Evaluating energy hardship alleviation

• Outcome objectives enlarged
  • Reducing energy costs for low-income households
  • Health and wellbeing benefits
  • economic stimulus and job creation; and
  • supporting continuous improvement of energy hardship policies

• Investment in thorough evaluation of *Warmer Kiwi Homes* flagship programme = basis for other evaluations

• Linked up evaluation for related programmes
  • Cross-agency evaluation steering groups (and beyond government)
  • Alignment of metrics and methods
  • Sharing learnings across agencies
Thank you
Nina.Campbell@eeca.govt.nz

www.eeca.govt.nz
(energy efficiency advice)

www.genless.govt.nz
(behaviour change)
EECA’s strategy

Our purpose
Mobilise New Zealanders to be world leaders in clean and clever energy use

Our strategic principles

- Focus on impact
  Pursue high-impact change with agility and at pace.
- Understand the customer
  Focus on those it is important to influence and influence them based on what they care about.
- Define the problem
  Identify what’s blocking progress and tackle it head on.
- Join the dots
  Work with and connect people and organisations who can be part of achieving our purpose.
- Display leadership
  Be proactive, have a fact-based point of view, own it.

Our strategic focus areas

- Productive and low-emissions business
  Mobilise decision makers and technical experts to accelerate action.
- Efficient and low-emissions transport
  Switch the fleet to low-emissions technology while ensuring that any remaining fossil-fuelled vehicles are as efficient as possible.
- Energy efficient homes
  Optmise New Zealanders’ use of renewable energy through energy efficient homes, technologies and behaviours.
- Government leadership
  Equip the public sector to innovate and lead the transition to clean and clever energy use.
- Engage hearts and minds
  Foster a society in which sustainable energy is expected and demanded.

Our desired outcome

A sustainable energy system that supports the prosperity and wellbeing of current and future generations
Our outcomes framework

Our desired outcome:

A sustainable energy system that supports the prosperity and wellbeing of current and future generations

Outcomes by focus area:

**Productive and low-emissions business**
- EECA’s client businesses demonstrate best practices, continuously improve their energy and emissions productivity and motivate other businesses to take action
- New Zealand businesses are continuously improving their energy productivity and using sustainable energy to contribute to New Zealand’s emissions reduction target

**Efficient and low-emissions transport**
- More New Zealanders choose a low-emissions vehicle over a fossil-fuelled vehicle and have a good experience using it
- People who do not buy a low-emission vehicle choose a more efficient fossil-fuelled vehicle

**Energy efficient homes**
- Households consume electricity more efficiently to reduce peak loading on infrastructure
- More New Zealanders live in energy efficient homes and make informed choices on energy efficient technologies and behaviours

**Government leadership**
- The state sector is an exemplar in improving its energy productivity and reducing its energy related emissions
- State services implement energy policy and programme to accelerate the transition to clean and clever energy use in New Zealand

**Engage hearts and minds**
- New Zealanders feel that the way they use energy positively contributes to achieving New Zealand’s climate change commitments
- New Zealanders expect and demand energy-related products and services based on their energy efficiency and sustainability

We are working to:

- Mobilise decision makers and technical experts to accelerate action.
- Switch the fleet to low-emissions technology while ensuring that any remaining fossil-fuelled vehicles are as efficient as possible.
- Optimise New Zealanders’ use of renewable energy through energy efficient homes, technologies and behaviours.
- Equip the public sector to innovate and lead the transition to clean and clever energy use.
- Foster a society in which sustainable energy is expected and demanded.
Our levers

Co-investing
We co-invest in energy-efficient technologies and renewable sources of energy

Motivating people
We motivate people to make clean and clever energy choices

Regulating
We regulate proven technologies and processes
NZ Treasury’s Wellbeing Approach

The Four Capitals

Intergenerational wellbeing relies on the growth, distribution, and sustainability of the Four Capitals. The Capitals are interdependent and work together to support wellbeing. The Crown-Māori relationship is integral to all four capitals. The LSF is being continually developed and the next iteration of the framework will consider the role of culture, including Māori culture, as part of the capitals approach in more detail.

Natural Capital

This refers to all aspects of the natural environment needed to support life and human activity. It includes land, soil, water, plants and animals, as well as minerals and energy resources.

Human Capital

This encompasses people’s skills, knowledge and physical and mental health. These are the things which enable people to participate fully in work, study, recreation and in society more broadly.

Social Capital

This describes the norms and values that underpin society. It includes things like trust, the rule of law, the Crown-Māori relationship, cultural identity, and the connections between people and communities.

Financial / Physical Capital

This includes things like houses, roads, buildings, hospitals, factories, equipment and vehicles. These are the things which make up the country’s physical and financial assets which have a direct role in supporting incomes and material living conditions.
Many Kiwis have seen an impact in some area of their lives

There is an ongoing anticipated impact on working situations, while some other impacts were more specific to lockdown.

**Impact of C19 on New Zealanders’ Lifestyle**

<table>
<thead>
<tr>
<th></th>
<th>Any impact</th>
<th>Large impact</th>
<th>Large impact moving forward</th>
</tr>
</thead>
<tbody>
<tr>
<td>The amount I drive</td>
<td>73%</td>
<td>46%</td>
<td>20%</td>
</tr>
<tr>
<td>My financial situation</td>
<td>66%</td>
<td>32%</td>
<td>30%</td>
</tr>
<tr>
<td>The way I work</td>
<td>60%</td>
<td>37%</td>
<td>27%</td>
</tr>
<tr>
<td>Mental health</td>
<td>52%</td>
<td>19%</td>
<td>17%</td>
</tr>
<tr>
<td>Job security</td>
<td>51%</td>
<td>27%</td>
<td>25%</td>
</tr>
<tr>
<td>Physical health</td>
<td>50%</td>
<td>18%</td>
<td>14%</td>
</tr>
<tr>
<td>My child’s education</td>
<td>30%</td>
<td>17%</td>
<td>12%</td>
</tr>
</tbody>
</table>

Source: EECA Consumer Monitor. C19_CURRENT - And in which of these ways is the COVID-19 situation impacting you currently? C19_FUTURE - How do you expect the COVID-19 situation to impact on you over the next 6 months? Base: n=624 New Zealanders.