

Insights Report

November 2026

# Powering Auckland's Future

## Urban form, energy and inclusive growth in Tāmaki Makaurau

# Executive summary

Affordable, secure and sustainable energy is a critical enabler of Tāmaki Makaurau Auckland's economic prosperity, household wellbeing and future growth. An independent report commissioned by Auckland Council and co-funded by the Energy Efficiency and Conservation Authority (EECA) provides insight into Auckland's energy future, with analysis on how urban form affects energy use and capital costs and energy as economic infrastructure.

The risk is not that Auckland lacks sufficient energy resources overall, but that infrastructure, investment and demand may not be sufficiently coordinated as the system changes. The report, by Concept Consulting Group (Concept), finds electrification is reducing exposure to declining gas supply and imported petroleum, but it also means more of Auckland's transport, industry, buildings and economic activity will depend on a reliable electricity system. This increases the consequences of network constraints, delayed investment and major supply disruptions.

Rapid electrification without corresponding network capacity and demand flexibility could delay new connections and increase costs, while a poorly managed gas transition could leave some businesses and households exposed before viable alternatives are available. These risks make energy resilience an economic development and infrastructure planning issue, rather than simply an energy sector issue.

To understand how these risks may evolve, Concept's study models a Reference (business as usual) pathway and a set of alternative futures for Auckland to 2050. The scenarios test how different combinations of urban form, transport demand, electrification, energy efficiency, distributed energy, industrial growth and fuel switching affect energy demand, infrastructure requirements, costs and emissions. The modelling is not intended to predict a single future, but to identify the choices that most strongly influence Auckland's exposure to energy system risks.

A more dispersed Auckland potentially costs about $14 billion more than business as usual, while compact planning could cut spending across Auckland by about $17 billion to 2035 – not counting the transport investment that path needs. The lowest-cost future is also the one that cuts emissions most.

Three factors explain most of the differences between the futures the report tested: how fast Auckland electrifies, how well it manages energy use and demand peaks, and how far people move away from private cars. Urban form shapes all three, so where homes and jobs go is an energy decision too.

Average household power bills in 2050 are projected to be similar to 2010 levels, adjusted for inflation and excluding EV charging. But the transition will favour those who can afford to electrify first. By 2050, an estimated 90 per cent of the highest-income households will drive an electric vehicle (EV), compared with 20 per cent of the lowest-income households. Early adopters

benefit from lower energy and transport costs, while others wait longer for savings and those still reliant on gas face rising costs as the gas network's customer base shrinks.

Energy increasingly shapes where businesses invest, and industrial users renewing gas contracts are likely to pay about double what they paid over the past decade. Auckland is likely to face the transition earlier and at greater scale than other regions, straining its infrastructure. Challenges like these can be a catalyst for innovation, making Tāmaki Makaurau a natural place to trial new technologies and business models.

The report suggests the harder constraint may be Auckland's ability to coordinate at the scale required for system change, not the availability of electricity itself. That means enough skilled people for electrical, building and network work, and supply chains that can keep up. Delays make this harder by squeezing the same work into fewer years.

Security comes from the whole system rather than self-sufficiency: strong grid connections, diverse generation, flexible demand, local solar with batteries and backup for critical services, and from infrastructure built to withstand climate hazards such as extreme winds and flooding.

**The report proposes seven principles for the transition:**

1. Reduce energy demand peaks through efficiency before expanding supply.
2. Prioritise investments that improve affordability, resilience, productivity and emissions at the same time.
3. Avoid locking in assets that could become stranded, such as new gas connections and car-dependent development.
4. Improve demand flexibility alongside electrification.
5. Build infrastructure ahead of demand where future demand is clear enough to justify it.
6. Keep the transition affordable and fair, so the last gas customers and low-income households do not carry disproportionate costs.
7. Build resilience into long-lived infrastructure.

Coordinated planning across the industry would look to strengthen Auckland's electricity affordability, resilience and productivity outcomes, and support economic growth, business competitiveness, investment attraction and regional prosperity.

Government, regulators, network companies, Auckland Council, businesses and communities each manage part of the picture. This report summarises what the research found and what the council's role could be, and seeks to open a conversation about how all stakeholders can work together.

**About this report**

This Insights Report draws on *Powering Auckland's Future* (2026), an independent assessment of Auckland's energy system to 2050 by Concept Consulting Group. Auckland Council's Economic Development Office commissioned the work, and EECA supported it in kind and co-funded it. This summary report also draws on the council's own reporting, which adds cost-of-living data, the need to plan for data centres and the first inputs from mana whenua.

All Tāmaki Makaurau Auckland mana whenua entities were invited to take part. Two iwi engaged with the council to discuss Auckland's energy challenges and opportunities from a mana whenua perspective. What they shared appears in theme eight, and further engagement is expected as conversations with industry, communities and other stakeholders continue.

This summary report groups the findings under the seven challenges Auckland faces as its energy system changes. Each section sets out the challenge, what Concept's analysis found and the opportunities and recommendations that respond to it, and most include a case study from Auckland or overseas. Readers can go straight to the challenges closest to their own work, but all seven share a root cause: demand, infrastructure and investment moving out of step.

The council has not yet decided what role it will play in Auckland's energy future, and nothing here describes a decision already made. Where this report makes recommendations, they are presented as insights from the research and analysis, to inform the conversations ahead between the council, industry, mana whenua, communities and government.



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Trains
Tickets
Station Concourse




# Auckland's energy at a glance

Auckland is the economic centre of Aotearoa New Zealand and consumes far more energy than it produces. It is going through several energy transitions at once.

- People: 1.8 million, 34 per cent of New Zealand's population, projected to rise to 37 per cent by 2048.
- Economy: $160b of gross domestic product (GDP) in the year to March 2024, or 38 per cent of national output, up from 34 per cent after the global financial crisis.
- Energy use: in 2025, Auckland consumer energy use was about 28 per cent of New Zealand's total, or about 136 petajoules[1] (one petajoule would power about 40,000 average homes for one year). Transport uses 62 petajoules (excluding international air travel), almost all imported liquid fossil fuel.
- Peak demand: peak electricity demand increases about 60 per cent by 2050 under business as usual, mostly from vehicle charging.
- Industry: nearly twice as many process heat sites as any other region, spread across many small and medium-sized users.
- Supply: electricity mostly generated elsewhere in New Zealand, gas from declining domestic fields and imported liquid fuels.
- Emissions: Auckland produces about 23 per cent of New Zealand's energy-related emissions, most of it from transport fuel. Under business as usual, emissions fall steadily as transport electrifies but don't reach zero, because jet fuel and some diesel remain.

Each part of the energy system faces a different problem. Transport is mainly a liquid fuels problem. Industry is mainly a process heat problem, as gas declines. Homes and commercial buildings are increasingly a peak load problem.

These differences demonstrate why a single forecast is insufficient for planning Auckland's future energy system. The pace and scale of transport electrification, industrial fuel switching, population growth, urban development and technology adoption will reshape different parts of the energy system in different ways. Consequently, the research looked at a range of future scenarios to explore how these interacting transitions could affect Auckland's future energy demand and infrastructure requirements.

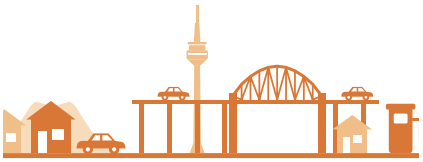
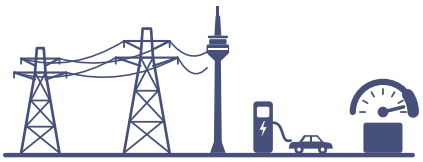
[1]Ministry of Business, Innovation and Employment (MBIE), '*Energy balances*', accessed 30 October 2026.

# Future energy scenarios and their impact compared

The research does not try to predict a single future. It compares a business-as-usual pathway – the Reference scenario – with four alternative futures to show which choices most affect Auckland's costs, resilience and emissions. Population growth is the same in every scenario. Concept tested the scenarios with network companies, transport agencies, major energy users, two iwi groups and other organisations.

The key choice is not between faster and slower electrification, but between a coordinated transition and an uncoordinated one.

In a coordinated transition, efficiency, demand flexibility, transport infrastructure and electricity infrastructure develop together. In an uncoordinated one, demand and investment develop out of sequence: electrification could outrun the networks, delaying new connections and raising costs, while a poorly managed exit from gas could leave households and businesses exposed before they have workable alternatives.

| Scenario | What it assumes | What it shows | Change in spending to 2035, compared with business as usual |
|---|---|---|---|
| **Reference (business as usual)**  | Current policies and trends continue | Electricity becomes the main fuel, peak demand rises about 60 per cent and gas use ends in the mid-2050s | Baseline |
| **Scenario 1: Compact and Efficient**  | Compact growth, strong public and active transport, efficient buildings, local solar and batteries, smart load management | Lowest energy demand, the largest fall in peak demand and the largest cut in emissions | About $17b lower |
| **Scenario 2: Expansion**  | Lower-density growth at the edges, more car travel, slower efficiency gains | More energy and more road, charging, network and fuel infrastructure | About $14b higher |
| **Scenario 3: Electricity Stress**  | Fast electrification without matching efficiency or flexibility | The greatest strain on electricity networks and connections | About $9.5b higher, almost all of it capital |
| **Scenario 4: Fuel Diverse**  | Efficiency and mode shift, slower electrification, gas kept for longer with imported liquefied natural gas (LNG) from 2028 | Less near-term pressure on electricity, longer exposure to gas and fuel prices | About $11b lower; operating costs rise after 2035 |

# A practical pathway for Auckland

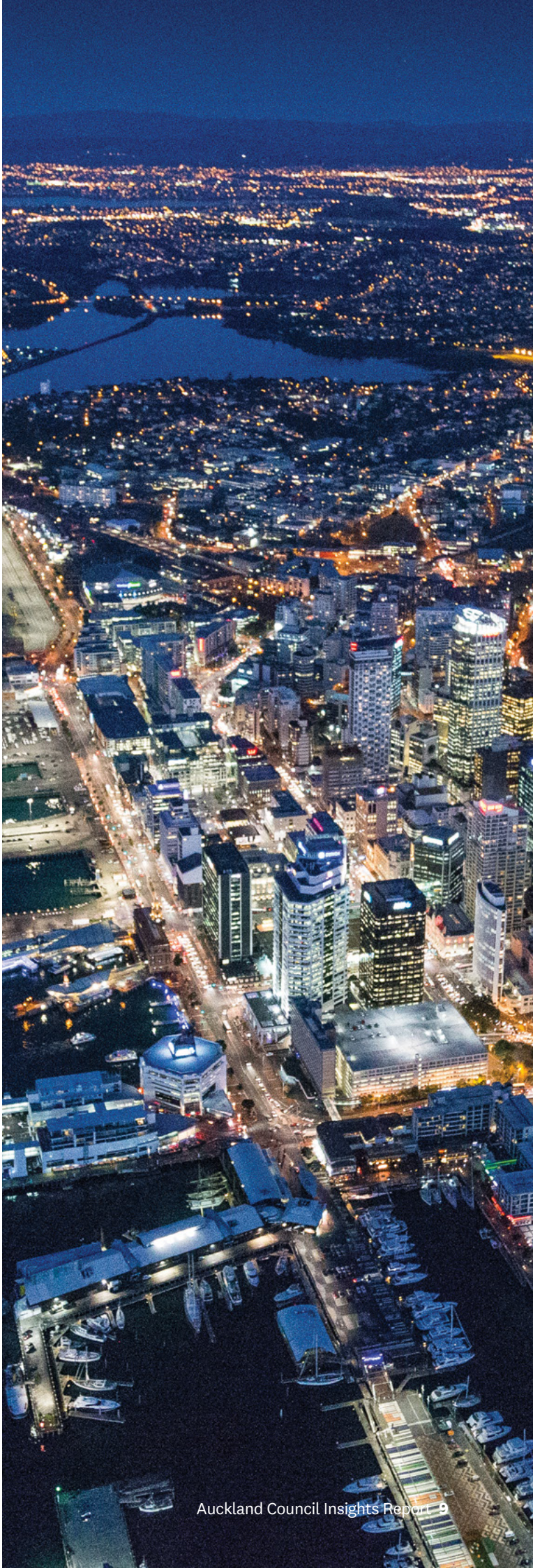
The report recommends the Compact and Efficient direction while retaining the ability to respond if actual development begins to resemble the Expansion, Electricity Stress or Fuel Diverse scenarios. The priority actions are to:

- integrate energy demand, electricity capacity and gas transition risk into spatial planning, growth decisions and infrastructure sequencing
- prioritise compact, infrastructure-efficient development and expand practical alternatives to private vehicle travel
- improve building and industrial energy efficiency and demand flexibility before sizing new supply and network infrastructure
- coordinate electrification with managed charging, demand flexibility, distributed energy and timely electricity network investment
- establish an orderly gas transition pathway, avoid new fossil gas lock-in and provide clear information and targeted assistance to affected consumers and businesses
- use the council's procurement, buildings, fleets and land to demonstrate efficient technologies and support charging, renewable energy and flexible demand
- establish a regional energy transition plan that can be implemented through partnerships
- monitor electricity demand, peak loads, network readiness, gas connections, transport behaviour, building retrofits, household affordability and emissions.

The report sets out three stages. In the first five years, Auckland should establish governance and monitoring, build energy into planning, find efficiency and demand-management opportunities, and coordinate plans for vehicle charging, industrial fuel transition and gas replacement. Years five to 15 shift to delivery at scale: building retrofits, public and active transport, managed charging, network investment, industrial fuel switching and household support. Years 15 to 25 bring long-term system change: a flexible electricity system, an orderly and equitable exit from fossil gas, resilient infrastructure, and transport and land-use planning integrated with energy needs.

By about 2050, the desired outcome is a compact and accessible city and region supported by a high-performance building stock, a mature, flexible electricity system, substantially reduced fossil gas use and infrastructure that is resilient to climate, supply and technology risks.

Updated modelling of Plan Change 120 (PC120) is broadly consistent with the Compact and Efficient scenario. The higher levels of growth enabled by PC120 are expected to increase electricity demand. This reinforces the importance of coordinating urban development, electrification and network investment to avoid unnecessary costs and infrastructure constraints.





The team at Lee Wang Hothouse. Photo by Trefor Ward, courtesy of Horticulture New Zealand.

# 1. Productivity and economic competitiveness

### Energy underpins investment

How Auckland manages its energy transition will affect where businesses invest and what it costs to operate here. For firms deciding where to locate or expand, the price and reliability of energy are becoming a bigger factor in business decisions.

### Energy as economic infrastructure

Regions with plentiful renewable energy and stable prices are better placed to attract and retain industry, create jobs and lift wages. Energy cost and reliability shape business competitiveness and investment decisions, and electricity is now the platform for modernising industry and growing sectors such as advanced manufacturing and digital services.

### Where the pressure will be felt most

Energy is a modest share of costs for most Auckland industries; for most sectors, electricity and gas stay below 10 per cent of input costs through the transition. The exceptions are energy-intensive firms and those facing big equipment or connection upgrades.

Industrial users renewing gas contracts are now likely to pay about $20 a gigajoule, double the typical price of the past decade, and the price is expected to keep rising towards the cost of liquefied petroleum gas (LPG) or diesel, about $30 a gigajoule.

Sites requiring high-temperature process heat for production processes such as glass and steel manufacturing, food processing and chemical production each require complex assessments and capital-intensive equipment changeover to switch off gas. Auckland has nearly twice as many process heat sites as any other region, so the switching task is significant.

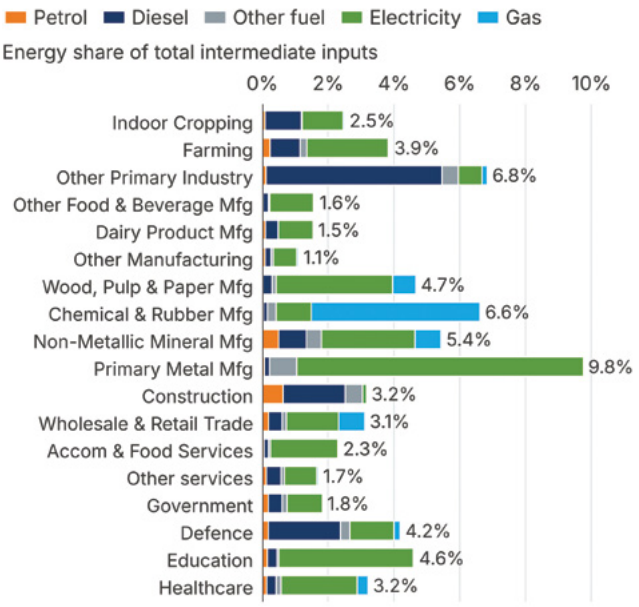



Figure 1: Energy's share of each industry's intermediate inputs. This provides an indication of New Zealand industries' direct exposure to changes in fuel and electricity costs. Industries with higher energy input shares are more likely to face material pressure on operating costs, margins, prices and investment decisions from rising energy costs. Source: Concept Consulting Group (2026).

For commercial buildings that largely rely on gas boilers for space heating only, the transition to well-established heat pumps and electrification upgrades is more straightforward.

Regardless, early efficiency work, flexible electricity network connection arrangements and coordinated planning for clusters of industrial sites can reduce the risk.

### The cost of coordinated and uncoordinated growth

To 2035, a Compact and Efficient pathway lowers regional capital and operating spending by about $17b compared with business as usual, in present-value terms. An urban Expansion pathway raises it by about $14b – a gap of about $31b. Much of the saving comes from households and businesses spending less on vehicles and fuel, alongside lower electricity infrastructure costs.

Those figures do not include the transport infrastructure needed to change how people travel. Auckland's Regional Land Transport Plan proposes a $63.1b programme over 10 years[2], much of it needed regardless of energy, and the Vehicle Kilometres Travelled (VKT) Reduction Programme (2024) estimates about $20.5b of capital spending for a package capable of reducing light vehicle VKT by 29 per cent by 2035[3].

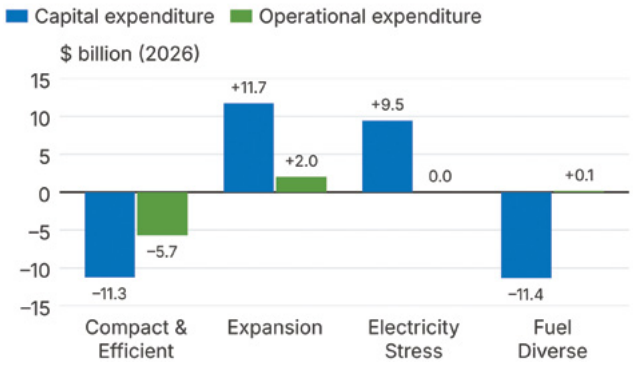



Figure 2: Change in capital and operating spending compared with business as usual, 2026–2035 (present value, $billion, 2026 dollars). Source: Concept Consulting Group (2026).

Concept expects the Expansion pathway to need the most transport infrastructure of any scenario – more roads, intersections, parking, longer bus routes and a wider spread of chargers and fuel stations – though existing plans don't put a figure on it. Compact and Efficient needs heavy public transport investment, but because it cuts vehicle use and avoids some road building, its whole-of-system cost may still be lower.

### The opportunity of scale

Auckland is likely to confront many aspects of the energy transition earlier and at greater scale than other regions. While that brings pressure on infrastructure, it also brings opportunities to deploy new technologies, use infrastructure better and capture economies of scale not available elsewhere. There are opportunities in climate innovation, distributed energy, smart infrastructure and emerging industries. The report suggests place-based testbeds, where new technologies and business models are trialled in real conditions, as one way to develop them.



Fastned charging bays in Energy Superhub Oxford. Photo courtesy of Oxford City Council.

**Case study**

## Oxford: a council-led energy superhub

Energy Superhub Oxford brought Oxford City Council together with energy companies, a social enterprise and academic partners to test how charging, storage and heating could work as one system. A large hybrid battery connects directly to the transmission grid alongside a public hub that charges 42 vehicles at once, an electric bus depot and heat pumps in 57 social homes. Since opening in July 2022, the hub has delivered more than 137,000 charging sessions and saved about 3600 tonnes of $CO_2$ by March 2025. Some tenants report bill savings of up to half. Almost £200 million of private investment is now replicating the model at five more United Kingdom sites.

[2]Auckland Regional Transport Committee (2024), *Auckland Regional Land Transport Plan 2024-2034*, cited in Concept Consulting Group (2026), s 7.7.

[3]AECOM (2024), *Auckland Vehicle Kilometres Travelled Reduction Programme*, cited in Concept Consulting Group (2026), s 7.7.



Devonport and Auckland CBD at dusk.

## 2. Infrastructure investment and network coordination

### Design for peak demand

Auckland's challenge is not a shortage of energy but keeping demand, generation and network investment in step, the report's central finding.

Auckland's energy future will be shaped by peak demand. As EVs and other technologies electrify transport, homes and businesses, the biggest challenge is ensuring networks can meet demand at the times people need energy most.

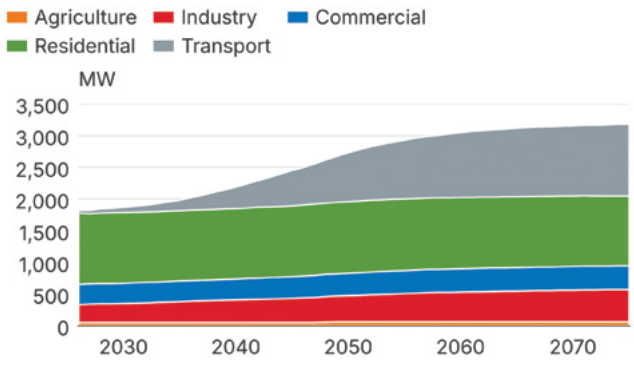



Figure 3: Forecast peak electricity demand in Auckland by sector in the Reference scenario. Source: Concept Consulting Group (2026).

### Peak demand drives network cost

Electricity networks are built for the busiest times, not the average day, and in Auckland's suburbs that time is a cold winter evening. Growth in peak demand is the main demand-related driver of network costs.

Under business as usual, Auckland's peak demand rises by about 60 per cent by 2050, mostly because of vehicle charging. It climbs higher still when electrification outpaces efficiency and smart charging gains, as in the Electricity Stress scenario. If new appliances simply followed people's habits, such as plugging in an EV after work, the average New Zealand household's contribution to the evening peak would rise by about 42 per cent, from roughly 2.2 to 3.2kW, almost all of it from EV charging. As an illustration, Concept's modelling shows that upgrading networks by about 40 per cent to carry that load would add about $65 a year to the average bill over the long run.

### Flexibility is as valuable as capacity

Much of that peak can be managed without anyone going without. For example, a smart hot water cylinder can be switched off for a few hours (and the water stays hot). EVs can be programmed to charge later in the night or when load is low, as Auckland's electric buses already are. The report finds that, at the household level, two appliances matter most for managing peaks: EVs and hot water cylinders. Managed EV charging is the most immediate opportunity, and vehicle-to-grid technology, where EVs feed power back at peak times, is already being tested in New Zealand.

The report says that simply electrifying more end uses, without addressing demand management, shifts pressure from fossil fuels onto the electricity system. Efficiency complements demand management. For example, a well-insulated home, a more efficient factory or a neighbourhood where people can leave the car at home all need less power, so less generation, network, charging and fuel infrastructure has to be built, or it can be built later. That's why the report counts efficiency as infrastructure investment, alongside its value in cutting emissions and bills.

### Network investment is already rising

National capital spending on electricity networks has grown by about 80 per cent over the past decade, driven by peak-demand growth and the renewal of ageing assets, and is expected to level off at that higher level[4]. Efficiency and demand flexibility can avoid or defer some of the build-out still to come. Vector, which serves most of urban Auckland, now proposes nearly $5.4b of capital investment over the 10 years to 2036[5]. It identifies data centres, large commercial connections, infrastructure projects and conversions from gas to electricity as material drivers. Counties Energy is investing in new substations and capacity in the fast-growing south.

### Data centres and emerging technology

Large electricity-intensive loads such as data centres are a newer driver of demand. The report counts data centres among the drivers of electricity consumption growth, but doesn't model them as a separate load. Its forecasts for the business-as-usual scenario assume electricity-intensive industries grow in line with the wider economy, and it notes demand could change more if they grow faster or slower. It recommends further analysis of their effects. As Auckland attracts this kind of investment, growth, infrastructure and energy planning will need to work together so energy availability supports economic development rather than limiting it.

Like Transpower's Te Kanapu Future Grid Blueprint[6], the report favours measures that hold up across many possible futures over bets on a single forecast. Efficiency, flexible demand, coordination of land use with infrastructure, timely network expansion and avoiding assets that could become stranded all meet that test.



Data centre server room.

**Case study**

## Setting the terms for data centres

In June 2026, about 40 mayors, including those of Melbourne, Sydney, London and Copenhagen, signed the Global Urban Data Centres Pact through C40 Cities. It responds to concern that the boom in data centres for artificial intelligence and cloud computing will strain grids and water supplies and push up power bills. Cities agree to voluntary standards: build on brownfield land, run on renewable energy with storage, have operators fund the grid and water upgrades they need, reuse waste heat and create local jobs. For Auckland, where data centres already drive network investment, it shows how cities are setting terms while growth is still taking shape. c40.org

[4]Concept Consulting Group (2026), s 7.1, Figure 62, drawing on Commerce Commission information disclosures.

[5]Vector Limited (2026), *Electricity Asset Management Plan 2026–2036*, cited in Concept Consulting Group (2026), s 3.5.

[6]Transpower (2026), *Te Kanapu Future Grid Blueprint*, cited in Concept Consulting Group (2026), s 12.1.



Wynyard Quarter urban regeneration precinct.

# 3. Urban planning and design

### Decisions beyond the energy sector shape Auckland's energy future

Where homes and jobs are located, and how people travel between them, are among the strongest influences on Auckland's energy demand.

### Urban form shapes the outcome

Across the scenarios, three assumptions explain most of the difference in results: the pace of electrification, improvements in efficiency and load management, and the extent to which people shift away from private and fossil-fuelled vehicles. Urban form influences all three. Land use and transport choices set travel distances, building types and how well infrastructure is used, and they decide where and when new electricity demand appears. As the report notes, energy demand should be seen not simply as something to forecast, but as an outcome that can be shaped through strategic planning decisions.

### Compact versus dispersed growth

In the Expansion scenario, recent trends towards higher density and more public transport reverse, and Auckland grows outward. Longer journeys, greater car dependence and less efficient buildings increase energy use and the road, charging, electricity and fuel infrastructure needed to serve the region. Slower electrification avoids some vehicle spending early on, but higher fuel costs, infrastructure requirements and emissions outweigh it over time.

Compact growth performs best when it comes with efficient buildings and managed demand. Without them, densifying existing suburbs can push extra load onto the evening peak and bring costly distribution upgrades.

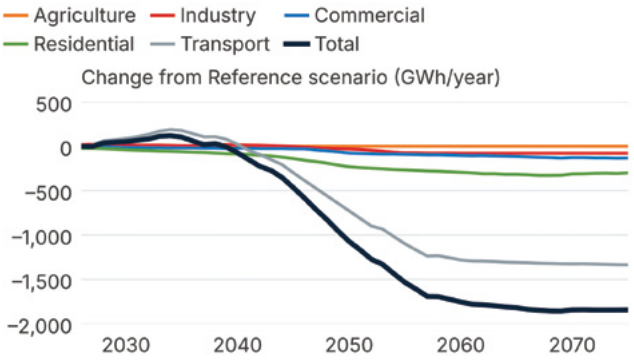



Figure 4: Electricity demand – Compact and Efficient compared with Reference. Source: Concept Consulting Group (2026).

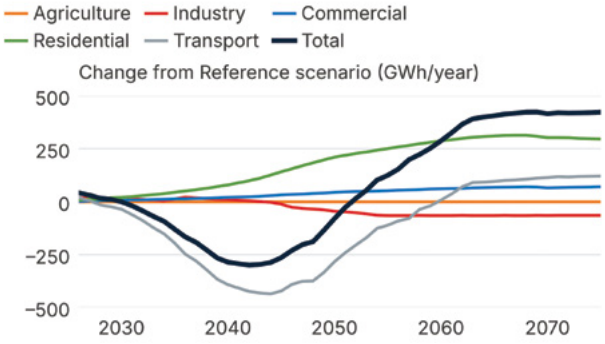



Figure 5: Electricity demand – Expansion compared with Reference. Source: Concept Consulting Group (2026).

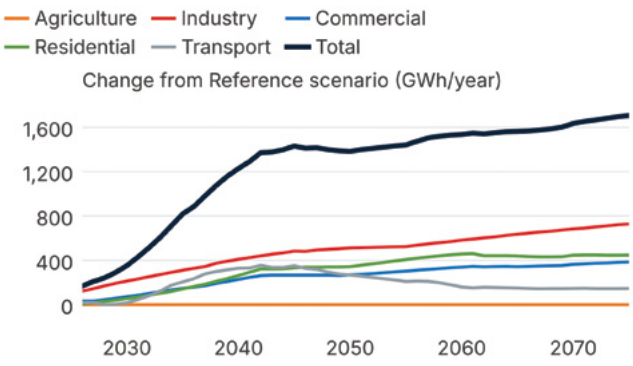



Figure 6: Electricity demand – Electricity Stress compared with Reference. Source: Concept Consulting Group (2026).

### Transport choices

The scenarios assume increasingly different travel patterns over time. By 2043, walking, cycling and public transport account for about 35 per cent of the kilometres travelled in the Compact and Efficient and Fuel Diverse scenarios, compared with about 11 per cent under the Reference path and about 8 per cent in Expansion and Electricity Stress. The difference matters most for lower-income households. In Electricity Stress, where electrification is fast but travel habits barely change, the savings go mainly to higher-income households until the 2050s. In Fuel Diverse, where public transport improves, low-income households gain more than high-income ones.

Shifting travel away from private vehicles needs investment in public transport, walking and cycling, interchanges and road space reallocation, although it can reduce the need for new road capacity and ease pressure on both the electricity and fuel systems.

How Auckland grows also changes what households spend on cars. In Compact and Efficient and Fuel Diverse, the scenarios assume that better public transport lets many households run fewer vehicles. Expansion has the highest vehicle costs.

### The levers

The council's strongest influences lie in how energy is built into:

- the Future Development Strategy
- district planning
- infrastructure sequencing
- transport planning
- procurement and its own assets

The council sets land-use rules, prioritises infrastructure and transport services, regulates activities and sets prices and charges, which together shape how and where development happens.

The report suggests structure plans (the forward planning set by the council to guide future growth and development) and major plan changes should identify likely electricity demand, vehicle charging needs and electricity network timing before growth areas are committed.

Because electricity is the cheapest option for space and water heating in new builds, the report also suggests the council could investigate, subject to legal advice and national policy, whether new subdivisions should be connected to the gas network at all. It also cautions that heavy-handed bans tend to be less durable than starting with new builds and widening over time.



Wynyard Quarter, Auckland.

**Case study**

## Urban form: Plan Change 120

Plan Change 120 (PC120) is the council's proposal to reshape where Auckland can grow. It contributes to an estimated theoretical capacity of 1.5 to 1.7 million homes, focused in well-connected places close to transport, jobs and existing infrastructure. It would enable buildings of at least six storeys within walking distance of the city centre, metropolitan centres and rapid transit stations, and 10 or 15 storeys around some centres and stations within 10km of the city centre. It also tightens rules for building where flood and other hazard risks are high. This is the compact, transport-led growth the research favours. It could show electricity network providers early where new demand will concentrate. [The amendments went out for consultation in August 2026, and decisions are expected mid-2027.]



Marsden Point fuel import terminal (former refinery), Whangārei.

# 4. Energy resilience and security

### Connectivity, not self-sufficiency

Global events affect New Zealand's energy prices, and Auckland's energy security has moved up the agenda alongside affordability and emissions. Declining domestic gas supply and periods of electricity system stress have reinforced the need for a resilient electricity system.

### Exposure to global volatility

The oil price shock from the 2026 Middle East conflict showed how exposed Auckland and New Zealand remain to international fuel markets. Although the disruption happened overseas, higher oil prices quickly reached transport, freight and business costs here. Transport uses 62 petajoules (46 per cent) of Auckland's energy each year (excluding international air travel), almost all of it imported petrol, diesel and jet fuel.

Electrification reduces that exposure, and the exposure to declining gas. But it also means more of Auckland's transport, industry, buildings and economy will depend on a reliable electricity system, which raises the stakes of network constraints, delayed investment and major supply disruptions. Resilience to extreme weather matters more as that dependence grows.

### Climate hazards

The report identifies natural hazards made worse by climate change, such as extreme winds and flooding, as a risk to Auckland's electricity and fuel infrastructure. It recommends that infrastructure planning account for climate hazards to electricity infrastructure, with resilience built in through physical robustness, diversity of supply, operational flexibility and the ability to adapt assets as conditions change. Because energy infrastructure can remain in service for decades, incorporating climate resilience and adaptability into investment decisions can help reduce future costs and risks.

### Gas decline

New Zealand's gas system has changed fundamentally. Production from existing fields has fallen faster than expected, estimates of remaining reserves have been revised down, prices have risen and some businesses have struggled to secure long-term supply contracts.

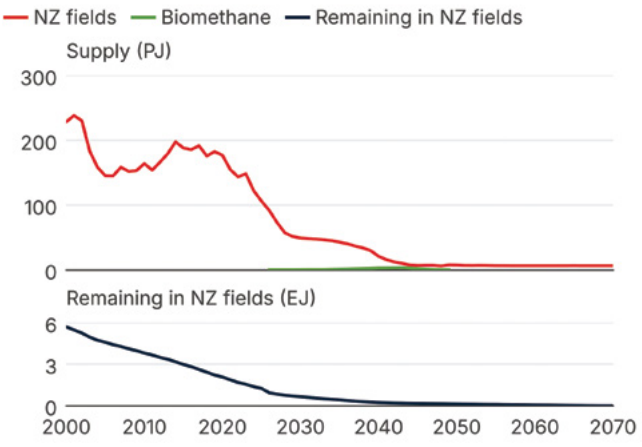



Figure 7: Gas supply and remaining resources – Reference scenario. Source: Concept Consulting Group (2026).

Under business as usual, household and commercial gas use ends about 2050 and industrial use about 2055. As reserves decline, wholesale gas prices are expected to rise until they reach the cost of the next-best fuel, such as LPG. The report's Reference scenario does not include imported LNG, which it assesses as uneconomic compared with electrification and other fuels.

Parts of the gas network could become uneconomic before the gas itself runs out, so the report stresses the need for an orderly transition that lets households and businesses progressively switch over the next couple of decades, rather than through an abrupt network closure.

**Petrol and diesel decline**

Terminals, storage, tankers and service stations carry high fixed costs, so as sales fall, the cost a litre can rise and sites may consolidate. The report stresses managing that contraction, so freight, emergency services and the remaining petrol and diesel vehicles keep reliable supply, alongside the minimum fuel stocks the national Fuel Security Plan[7] requires.

**Local and national grid**

Auckland's resilience does not have to come from generating its own power. The region draws on a geographically diverse mix of hydro, geothermal, wind, solar and thermal generation across the upper North Island, through a transmission network with substantial redundancy, and the report finds transmission is generally at least as reliable as local generation. A major supply failure would still cause serious disruption, given Auckland's size. Strong network connections, flexible demand, local solar and batteries, and backup for critical services each add to its resilience.



Wairakei geothermal field near Taupō.

[7]MBIE (2025), *Fuel Security Plan*, cited in Concept Consulting Group (2026), s 7.7.



Wind farm in Victoria, Australia.

**Case study**

## Melbourne: buying and storing clean power together

The City of Melbourne brought seven large energy users together, in 2020, in the second Melbourne Renewable Energy Project. Together they buy 110GWh of wind energy a year under a 10-year contract. The power supplies shopping centres, offices, university campuses and factories across the city. Locally, Victoria's 100 Neighbourhood Batteries Program offers grants of up to AU$400,000 to councils, community groups, businesses and others. About 90 batteries had been funded before its final round. They store cheap renewable power to cut bills, ease peak demand on local networks and provide backup during outages.



Technician servicing outdoor heat pump unit.

# 5. Equity and affordability

### The savings are spread unevenly

Electrification should lower household energy and transport costs over time as fossil fuel prices grow. The households and businesses with the least money are likely to get those benefits last, and to carry more of the cost along the way. Managing the transition well raises the chance of inclusive growth and shared benefits.

### Affordability

In a national Horizon Research poll[8] of 1028 adults in August 2026, 72 per cent wanted the Government to prioritise cutting electricity and gas bills. Adjusted for inflation, and not counting EV charging, the average New Zealand household's power bill is projected to rise about 19 per cent from its 2023 low by 2029, then level off before declining again. By 2050 it would be about the same as in 2010, despite heavy investment in generation and networks. The price of gas a gigajoule is projected to more than double before 2050, with the last customers carrying the network's fixed costs.

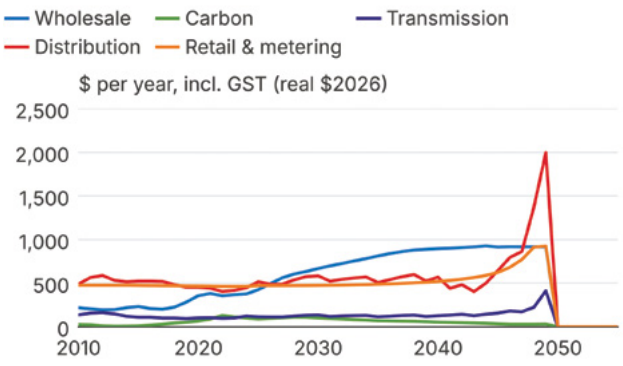



Figure 8: Average residential gas bill – historical and modelled. Source: Concept Consulting Group (2026).

### Health and wellbeing

Energy affects health most directly through cold homes. In the year to June 2024, 6.7 per cent of New Zealand households, about 132,000[9], could not afford to keep their homes adequately warm. The lowest-income households already spend about 4.5 per cent of their budget on electricity and gas, rising to about 5.5 per cent during the gas transition, before settling at about 5 per cent once electrification is complete.

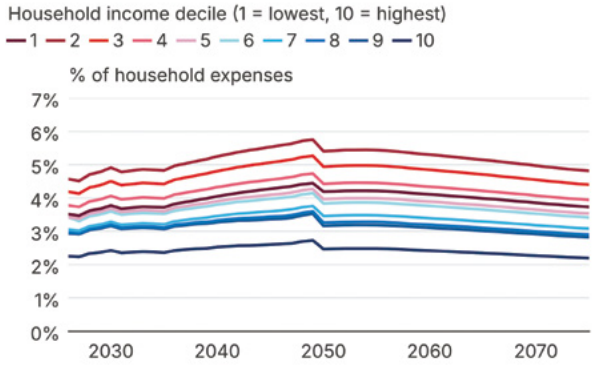



Figure 9: Household energy costs as a proportion of household expenditure by income decile. Source: Concept Consulting Group (2026).

### The two-speed transition

A 'two-speed' transition occurs when households and businesses with the resources to invest in new technology are already saving money and reducing emissions, while those that cannot invest carry a growing share of the cost.

Across income groups, transport takes a similar share of household spending (15 to 18 per cent), but lower-income households are more likely to live in

car-dependent areas and already spend the largest share of their budget on buying vehicles. Under business as usual, EV uptake reaches about 90 per cent among the highest-income households by 2050 and about 20 per cent among the lowest, which catch up only as more used EVs reach the second-hand market, approaching full uptake about 2060.

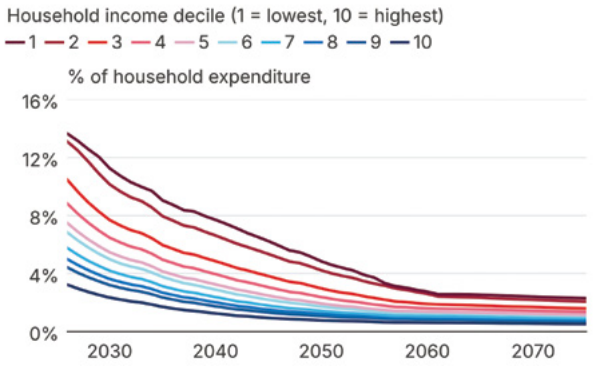



Figure 10: Vehicle fuel and maintenance costs by income group. Source: Concept Consulting Group (2026).

The report also finds that better public transport does more for low-income households than faster EV uptake, as explored earlier.

Replacing gas hot water costs about $4000 for a standard electric cylinder, and $7000–$9000 for a heat-pump water heater, but operating costs for a heat pump system are 60–75 per cent lower than a standard electric cylinder and savings are higher for larger households than for one- or two-person households. Households without capital may have to take the cheaper, less efficient option, and pay for it in higher power bills for years.

### Gas network equity

The gas network's costs are mostly fixed, so as customers leave, those who remain pay more. Roughly, a 10 per cent fall in demand lifts pipeline prices by 10 per cent. Nationally, household and commercial gas demand has been falling by about 8 per cent a year over the past couple of years. Vector has estimated that an unmanaged wind-down could leave $973m of network costs unrecovered by 2050[10]. Even in the best overall future scenario, users will need targeted help, both financial and educational, along with a clear policy direction of travel, and supportive programmes through the trades to help consumers switch.

Low-income households are less likely to be on gas. The risk lies with those who are and find it hardest to leave, especially renters. About 40,000 rented homes in Auckland have gas, and landlords are not incentivised to disconnect from gas. Low-income households that stay connected to gas and cannot switch could see their energy bills more than double.

For most households, switching pays for itself. In a new home, a heat pump saves about $17,300 over 15 years compared with gas heating. For a household whose gas heater has 10 years of life left, switching now still returns about 17 per cent on the investment. Clear information about the options, fair disconnection charges and targeted help for renters and low-income households would all reduce the risk of the last customers on the gas network being the ones least able to carry the cost.



Installation of Terra Lana wool insulation.

**Case study**

## Auckland: what home retrofits really deliver

A 2022 Vector and EECA study used smart meter data to measure the effect of insulation and heat pumps in Auckland homes. Insulation cut electricity use, most of all in cold weather and at peak times. Heat pumps didn't reduce measured electricity use overall, though the study didn't track other fuels. The bigger gains may be warmer, healthier homes that retain heat – especially where households had held back on heating because of cost – and lower winter peaks on the network. Tenants and low-income households stand to gain the most, but are often least able to pay for upgrades or get landlords to act.

Broader savings to 'NZ Inc' from warmer, healthier homes include reduced burden on the health system during winter, increased productivity from reduced sick days, reduced family violence and improved education from children being better able to study – all of which have been shown to be outcomes of moving households from cold, damp homes to warm, dry ones.

[8]Horizon Research (2026), *Public blame coalition for price rises*.

[9]MBIE (2025), *Report on energy hardship measures – year ended June 2024*.

[10]Vector Limited (2023), *Managing the Gas Transition: Option Preserving Solutions to Manage Consumer Risks from Gas Asset Stranding*, cited by Concept Consulting Group (2026), s 3.4.



Kawa Marae, Aotea Great Barrier Island.

# 6. Mana whenua perspective and opportunities in the transition

### Energy security and economic benefits

The council sought input from mana whenua as part of the broader engagement process. Participants who engaged with the council highlighted the energy transition as an opportunity for Māori leadership, participation and long-term economic benefit.

### Who took part

All Tāmaki Makaurau Auckland mana whenua entities were invited to take part in the research. Two iwi engaged with the council to discuss Auckland's energy challenges and opportunities from a mana whenua perspective.

Mana whenua aspirations range from local energy resilience and papakāinga energy security to large-scale renewable energy development that generates long-term economic benefit for iwi, future generations and the wider region.

### Large-scale renewables reduce cost

The report explains how large solar farms generate electricity far more cheaply than rooftop panels. It estimates rooftop solar could cost up to 65 per cent more a kilowatt-hour than large solar farms after accounting for factors such as rooftop solar's higher capital cost a kilowatt and lower generation yield. Rooftop solar adds most value when paired with batteries and flexible demand, while shared solar schemes, community energy projects and public housing installations can widen access to lower-cost electricity and help reduce energy hardship.

### Leadership and partnership

Mana whenua also identified opportunities for Māori participation and leadership across workforce development, innovation, community resilience initiatives, renewable energy investment and energy system planning. The report suggests partnership with mana whenua should extend from consultation to co-design and, where appropriate, ownership of initiatives, including community energy, marae resilience, distributed generation, skills development and investment models that reflect Māori aspirations and tikanga. It also notes that Māori-led energy initiatives and new kinds of energy market solutions may achieve more than economic benefits alone.

Further engagement with mana whenua and mataawaka entity partners is expected as conversations with industry, communities and other stakeholders continue.



Line mechanics, Kawau Island. Photo courtesy of Vector.

# 7. Future skills and workforce development

### The capacity to deliver

The report suggests Auckland's ability to deliver change may become a bigger constraint than the supply of energy itself. It calls this transition capacity: the ability of institutions, markets and infrastructure providers to deliver change in a coordinated way.

### The cost of waiting

Over the coming decades, households, businesses and infrastructure providers will all replace vehicles, heating systems, industrial equipment and network assets. Delaying those decisions does not remove the need to make them. It squeezes the same investment into a shorter period, which puts more pressure on electricity networks, supply chains, capital and skilled labour at once. Separate projects can end up competing for the same equipment, contractors and network capacity.

### Building, electrical and network skills

The transition needs people for electrical work, building performance, vehicle charging, network upgrades and industrial fuel switching. The report points to overseas experience that working with the trades is central to a successful transition away from gas. That can include retraining for new electric heating technologies, specific support for gas fitters who will need to retrain, and self-certification for qualified installers.

Universities, wānanga, polytechnics and industry training organisations will help build that workforce. The report suggests the council should work with businesses, developers and industry associations to define those needs. The council's Economic Development Office has responsibilities for future workforce development, and the report suggests insights from trials of new energy technologies could strengthen the case for new jobs and training.

### Māori workforce development

Auckland is home to about 23 per cent of Māori in New Zealand. Its population as a whole is also younger than the rest of the country's: 68 per cent of Aucklanders are of working age, compared with 65 per cent elsewhere. The report sees skills development as part of a partnership with mana whenua that goes beyond consultation.

# A shared challenge

No single organisation can deliver Auckland's energy transition, and the report suggests organising the work around the decisions and assets each partner already controls.

The agencies involved have historically worked on separate parts of the energy, transport, land use and infrastructure system. The report notes this tends to produce fragmented policy and missed chances to manage trade-offs between sectors.

The Auckland region needs a more integrated approach and sustained partnerships between local and central government, regulators, Auckland Transport, NZ Transport Agency Waka Kotahi, Transpower, Vector, Counties Energy, EECA, gas infrastructure providers, businesses, mana whenua and community organisations.

**Partners needed for a holistic approach**

| Partner | What it controls or strongly influences |
|---|---|
| Central government and regulators | Electricity market settings, gas transition policy, building regulation, transport pricing, infrastructure funding, consumer protection |
| Transpower | The national grid, Auckland's long-term demand outlook, major grid investment |
| Vector and Counties Energy | Electricity distribution networks, connections, tariffs, flexibility programmes |
| Auckland Council, Auckland Transport and NZ Transport Agency Waka Kotahi | Public transport, walking and cycling networks, road space, vehicle charging, fleet transition |
| Auckland Council | Spatial and district planning, infrastructure sequencing, procurement, its own buildings and land, public information, convening |
| EECA | Industrial energy assessments, efficiency programmes, the design of household and business assistance |
| Gas infrastructure providers (Vector and Firstgas) | The pathway for declining demand, new connections, decommissioning |
| Mana whenua and mataawaka | Partnership, co-design and, where appropriate, ownership of energy initiatives |
| Businesses, the Auckland Business Chamber and developers | Investment and technology choices, major connections, workforce needs |
| Community organisations and finance providers | Reaching households that conventional information and lending channels miss |
| Education and training providers | Building the workforce the transition needs |
| Built environment professions (NZIA, NZPI, NZILA, UDIA, NZGBC, Engineering New Zealand, ACE New Zealand, Ngā Aho) | How growth is planned, designed and specified: urban form, building envelope performance, all-electric systems, demand flexibility, on-site generation |

The report suggests spending the first five years on governance, monitoring and planning, scaling up delivery to year 15 and completing the shift by year 25, about 2050. It suggests tracking a short set of indicators every year, from peak demand and gas connections to household energy costs, to show early whether Auckland is heading towards the Compact and Efficient direction or drifting from it.

**Questions for the conversation ahead**

- How can growth, transport and network planning share information early enough for investment to keep pace with demand?
- What would a clear signal about the future of pipeline gas look like, and who is best placed to give it?
- How should households, renters and small businesses that cannot afford to switch be supported, and by whom?
- How should large new loads such as data centres be planned for?
- How can mana whenua aspirations shape partnerships from the start?
- Where are skills and supply chains likely to run short first?

As the report concludes, “Auckland does not need certainty about every aspect of its 2050 energy system before acting. It does, however, need a durable direction, clear institutional responsibilities and a process for adjusting decisions as evidence changes.” This insights report, and the Concept report it primarily draws from, is offered as a starting point for that conversation.



## About the report and sources

The main source is *Powering Auckland's Future* (Concept Consulting Group, 2026), which contains the full methodology, scenario results, cost analysis and appendices behind this report. The modelling uses Concept's Emissions-Economy New Zealand (ENZ) model with Auckland-specific assumptions and evidence from Auckland Council, Transpower, Vector, Counties Energy, EECA, MBIE and other sources. Some information in this summary report also draws from Auckland Council's subject experts.

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This report is a starting point for a wider conversation about Auckland's energy future. If you have feedback, questions or ideas, please get in touch.

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Te Kaunihera o Tāmaki Makaurau