Report for the Guernsey States' Trading Supervisory Board

Final Report

26 April 2023

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STSB commissioned Frontier Economics to benchmark Guernsey Electricity's costs and tariffs

Context

- The Guernsey States' Trading Supervisory Board (STSB) has an oversight role as shareholder in Guernsey Electricity (GEL)
- STSB has responsibility for the approval of GEL's electricity supply tariffs (this responsibility was transferred from the Guernsey Competition and Regulatory Authority to STSB in 2021).
- The STSB previously considered GEL's application to increase its tariffs with effect from 1 July 2022.

Key areas of this review

- Before considering any further tariff applications from GEL, the STSB commissioned Frontier Economics to review GEL's:

1. Cost efficiency review*
2. Tariff review

STSB has agreed that the efficiency benchmark is to be completed in two phases.* This project focuses on the first phase.

We will discuss the findings from each workstream today

* **1.** A high-level assessment of GEL's efficiency relative to equivalent electricity companies to be undertaken during Q1 of 2023.
2. A "deep dive" efficiency review of any specific areas of concern identified during phase 1 to be undertaken in the remainder of 2023.

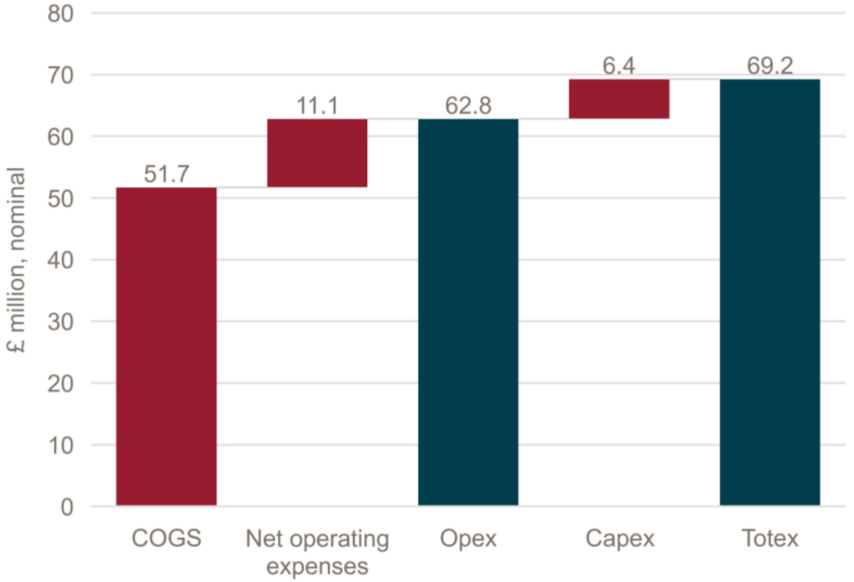
Contents

This section details our cost efficiency benchmarking of GEL

GEL is benchmarked against comparable companies at multiple cost levels

Comparators	▪ GEL is benchmarked against **Jersey Electricity (JEL)** and **Manx Utilities (MU)** as these are also vertically integrated companies that are similar in size and scope to GEL.
Time period	▪ Benchmarking is conducted across three financial years 2019/20 to 2021/22. ▪ However, GEL's data for the year 2021/22 is provisional, and our results for that year should be interpreted with caution.
Cost level	▪ We benchmark three different costs levels: totex, total opex and net operating expenses. ▪ Net operating expenses are assessed separately from total opex, which also includes costs of goods sold (COGS). ▪ This approach provides a more disaggregated view as COGS are mainly driven by the costs of purchased electricity which are exogenously determined. ▪ The share of GEL's net operating expenses in total opex was 18%, and the share of total opex in totex was 91%, in the financial year 2020/21.

Breakdown of GEL's 2020/21 expenditure



See the Annex for a glossary of technical terms used in this report.

Four different metrics are used to assess cost efficiency

Cost drivers and efficiency metrics

- We benchmark GEL on a unit cost basis. The efficiency metrics are based on key drivers that cause costs to the business. These are costs per:
  1. kilometre of network length;
  2. GWh of throughput;
  3. customer; and
  4. unit of 'composite scale variable' (CSV).
- A CSV is commonly used in cost benchmarking as a way of combining other variables. The use and derivation of the CSV is outlined in further detail below.

CSV

- While using different efficiency metrics provides disaggregated measures of efficiency, they may lead to different results depending on the cost driver used. For example, a network may have relatively lower costs per customer but higher costs per unit of network length.
- CSV combines cost drivers into a single variable. Therefore, the efficiency metric that uses a CSV captures the overall differences in network scale, and thus can complement the other metrics.

CSV Weights

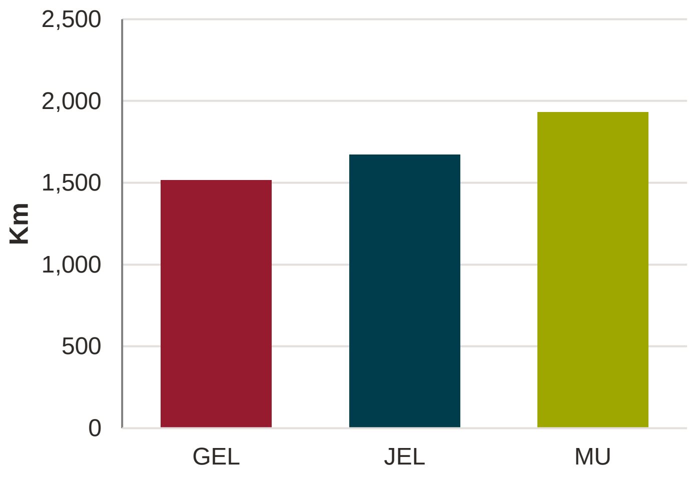
- We assign a 50% weight to network length, and 25% weight to customer numbers and units distributed respectively.
- The same approach has been previously used by regulators in the UK and Ireland.

Cost driver	Weight
Network length	50%
Customer numbers	25%
Units distributed	25%

The cost driver trends for GEL, JEL and MU are outlined on the next slide.

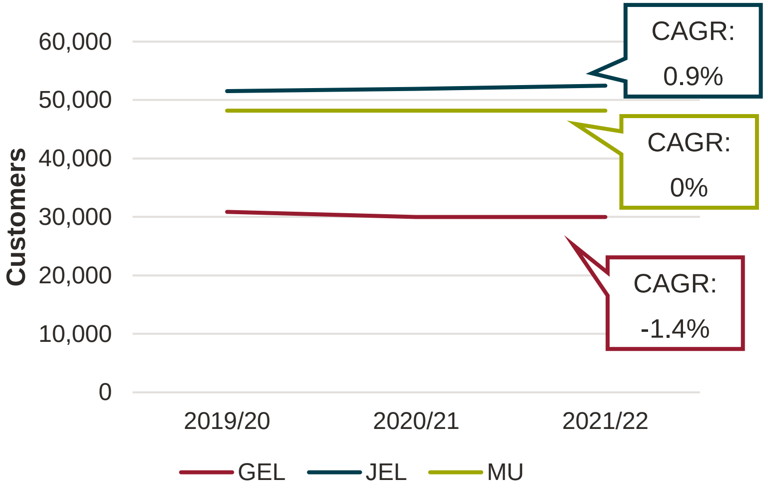
GEL's relative scale depends on the metric used, but in general GEL could be considered the smallest network

Network length including subsea cables



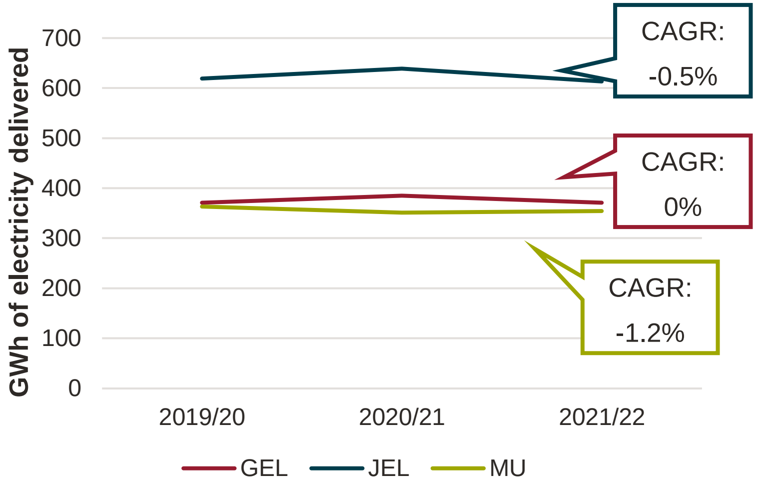
- GEL's network length is 21% smaller than MU's and 12% smaller than JEL's.

Customer numbers



- GEL's customer numbers are c.40% lower than JEL's and MU's.

Throughput



- GEL's throughput is c.40% lower than JEL's and roughly the same as MU's

Source: Frontier analysis of GEL, JEL and MU data publicly available on the respective company websites.

Cost exclusions and adjustments are applied to allow a more ‘like-for-like’ comparison, although cross-jurisdictional comparisons are not perfect

Objective of adjustments is to get more meaningful results

- Adjustments and exclusions are applied to reduce the impact of elements that are outside of the control of the network companies.
- The objective is to isolate, as much as possible, the differences in actual efficiency between the comparators.

But there are challenges with all inter-company benchmarking

- The adjustments might not perfectly capture all the exogenous differences between companies due to:
  - required data not being publicly available; or
  - the relationship between the exogenous factors that we wish to control for and the costs that we are benchmarking not being clearly defined or easily observed.

And these challenges increase with cross-jurisdictional benchmarking

- More generally, cross-jurisdictional benchmarking brings more challenges in terms of cost comparability.
- In particular, there are typically more unobservable factors that may exogenously affect companies’ costs.
- This may involve factors like the differences in the regulatory regimes or differences in the management and ownership structures.
- For example, differences in Network Security Standards can impact on companies’ costs*. However, the relationship between the security standards and costs is not easily observable from the publicly available data – in particular as differences in standards are complex – and hence these differences are not controlled for in our model.

Implication: Benchmarking results are informative for assessing efficiency in the round, but should not be the only source of evidence when assessing GEL’s required revenues

See the Annex for more details on the differences in network security standards between companies.

We exclude certain costs to ensure a more like-for-like comparison

Our approach to cost exclusions

- We exclude costs that are:
  - out of the scope of activities undertaken by electricity companies;
  - costs that are incurred by GEL but not by other companies (and costs incurred by other companies but not GEL); and
  - one-off lumpy capex items to ensure that efficiency metrics are not impacted by the companies' investment cycles.

GEL costs excluded

- Opex and capex related to non-core activities for both GEL and comparators.
- GEL's opex and capex related to UMAX (GEL's new ERP implementation).
- GEL's one-off, lumpy capex item related to the Guernsey Jersey subsea cable overlay (2019/20).

Comparator costs excluded

- We assume that Jersey Electricity has not incurred lumpy capex items during the modelled period.
- We use confidential information provided by Manx Utilities on their costs exclusions.

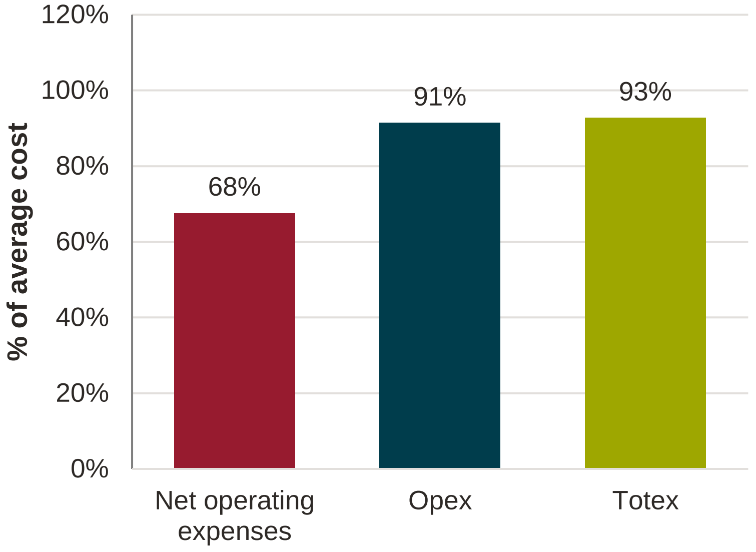
We adjust the cost data to capture differences in macroeconomic and operating environments

(1)Financial year adjustment	▪ There are some differences in reporting years. GEL and JEL report on October to September basis whereas Manx Utilities reports on April to March basis. ▪ Therefore we convert Manx's costs into GEL's financial year by inflating them for six months of HICP inflation.[1]
(2) Inflation adjustment	▪ We adjust all cost data to a consistent 2021/22 base prices by using respective HICP indices.
(3) Regional wage adjustment	▪ We adjust the companies' labour-related costs based on the relative differences in earnings in electricity, gas and water sectors.
(4) Sparsity adjustment	▪ Relatively sparser distribution networks may face higher costs. ▪ To account for this, the labour costs of companies operating in sparse areas are reduced by up to 5%.[2]
(5) Adjustment for transmission losses	▪ Different companies incur different transmission losses, but such losses are exogenous to the companies' efficiency. Therefore we run a sensitivity to our model that equalises the transmission loss costs across companies.

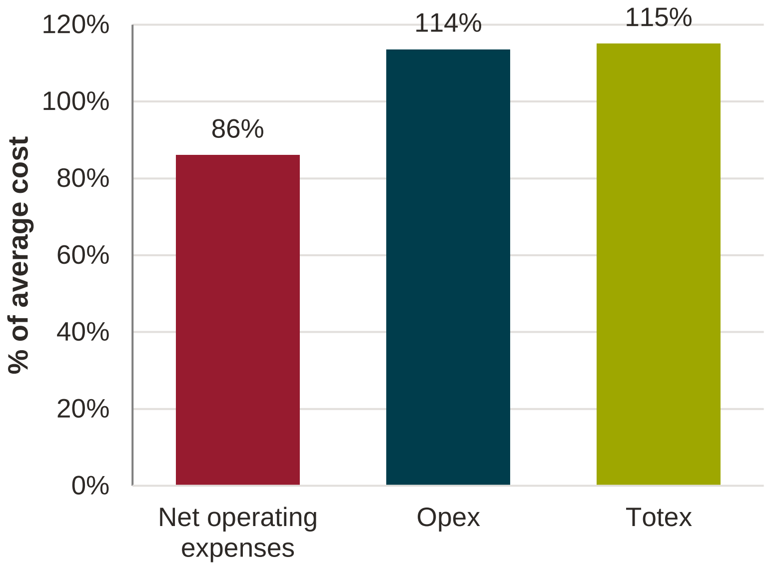
[1] The same approach has been applied by CEPA when benchmarking Irish distribution networks.
[2] Ofgem has historically applied 10% to 15% maximum adjustment, and therefore 5% is a conservative assumption as it is less likely to lead to an overadjustment.

GEL's estimated efficiency depends on cost driver used - GEL performs best on cost per km, but performs less well on a cost per customer basis

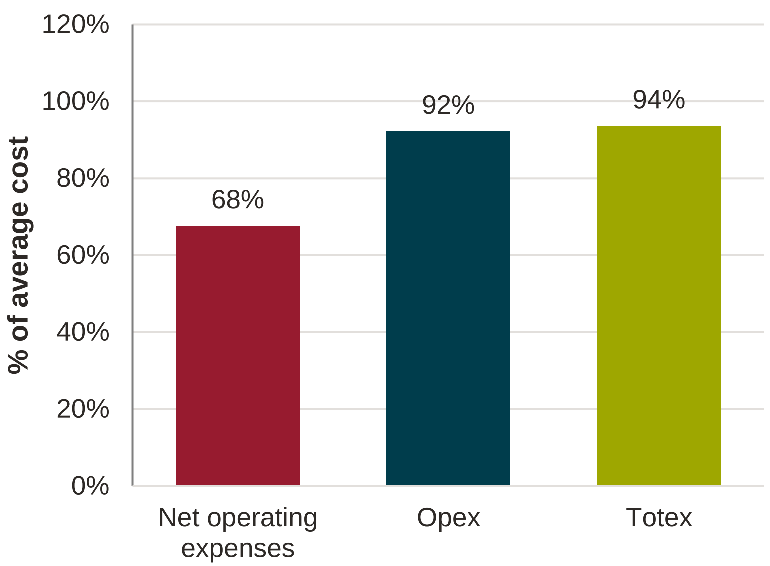
GEL's cost per km
(% of benchmark average)



GEL's cost per customer
(% of benchmark average)



GEL's cost per unit distributed
(% of benchmark average)



- GEL has the lowest cost per km in the benchmark for all cost categories.
- GEL is estimated to be particularly efficient for net operating expenses, being 32% below the average of the benchmark.

- GEL has the highest estimated cost per customer in the benchmark for Opex and Totex.
- GEL still has the lowest cost per customer when looking at net operating expenses.

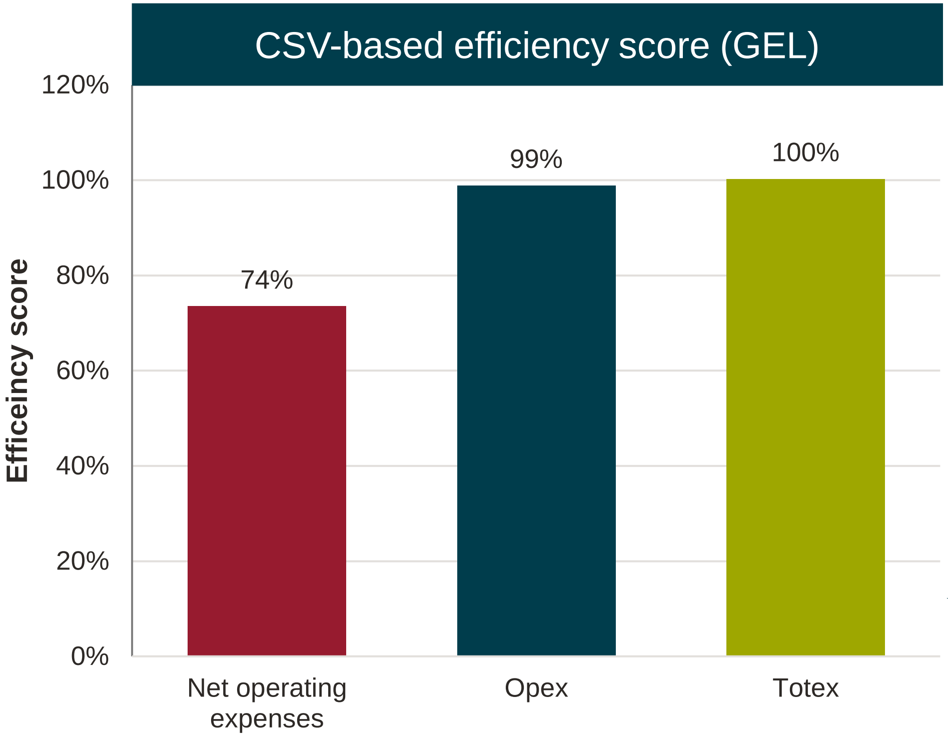
- GEL's cost per unit distributed sits between those of JEL and MU for Opex and Totex.
- GEL still has the lowest estimated cost per unit distributed when looking at net operating expenses.

The values presented are based on the average of costs per cost driver over 2019/2022.

GEL is estimated to be relatively efficient across all cost categories in our base-case CSV model

Results are expressed in terms of percentage efficiency score.

- An efficiency score below 100% implies efficiency.
- For example a score of 95% means that cost per csv are 5% below the average.



Opex and Totex

GEL's opex and totex are slightly below or at the efficiency threshold. In particular, GEL's opex is slightly below the efficiency threshold and its totex is at the efficiency threshold.

Net operating expenses

GEL is estimated to be particularly efficient on net operating expenses where its costs per CSV are 26% below the average.

Sensitivity analyses

We present the results of four sensitivity analyses on the following slide:

1. **Alternative definition of CSV**: in this sensitivity an equal weight is applied across the cost drivers (33%).
2. **No RWA adjustment:** in this sensitivity we do not apply a regional wage adjustment.
3. **Transmission losses:** in this sensitivity the costs are adjusted to account for the differences in transmission losses between the comparators.
4. **Exclusion of 2021/22 data**: the last financial year includes preliminary data for GEL.

The values presented are the average of costs per cost driver over 2019/2022.

Results are robust to various sensitivities, but excluding 2021/22 data has an impact on the results

- Since our sample is based on only three years of data, excluding any single year may result in significant changes in efficiency results.
- Therefore, due to a relatively small sample, the benchmarking results should be interpreted with caution.

CSV-based efficiency score under different scenarios (GEL)

Scenario	Net operating expenses	Opex	Totex
Base	74%	99%	100%
(1) CSV weight	74%	101%	102%
(2) No RWA	71%	97%	99%
(3) Transmission losses	74%	98%	100%
(4) Exclude 2021/22	80%	111%	112%

- GEL always has the lowest cost per CSV when looking at net operating expenses, regardless of the assumption used.

- Using a different assumption on **CSV weights** or accounting for **transmission losses** does not impact the relative efficiency of the companies in the benchmark.
- Excluding the **RWA** has a slight impact on Opex, where GEL becomes the most efficient.
- **Excluding 2021/22 data** means that GEL becomes the least efficient in terms of opex and totex per csv.

GEL is estimated to be relatively efficient – and thus no catch-up efficiency requirement has been identified...

Catch-up efficiency

- Our benchmarking suggests that GEL's net operating expenses, opex and totex are, on average, efficient when compared to JEL and Manx.
  - In particular, GEL performs best on the **net operating expenditure** metric.
  - There is a potential gap to JEL on certain opex and totex measures, which appear to be driven by differences in **costs of goods sold**. It is unclear whether this is an economies of scale effect – that is not controlled for in the model – or a potential efficiency gap. This may be an area of future potential exploration.
  - GEL has indicated that one of the drivers of higher COGS relative to JEL is that its supply mix relies more on indigenously produced electricity due to capacity constraints of the interconnector. GEL's COGS are higher since the indigenously produced electricity in Guernsey is more expensive than that produced in Jersey or imported via the interconnector.
- However at this time, we have not identified a catch-up efficiency gap.

Key risks to GEL's future efficiency

- GEL faces significant cost risk that, if not managed well, could effect future relative efficiency. These include:
  - **changes in external contract prices:**
    - increases in the wholesale electricity prices that GEL is subject to, reflecting the wider European energy market developments; and
    - increases in other wholesale contracts (e.g. network maintenance) due to wider inflationary pressures.
  - **upwards wage pressures:** GEL may face upward wage pressures due to higher inflation.
- It will be important to monitor the wider cost environment in which GEL operates and ensure that cost pressures that GEL may be subject to do not negatively reflect on its relative efficiency.

Ongoing efficiency

- Even the most efficient company is expected to make productivity improvements, for example by improving processes and employing new technologies.
- Other regulators have recently set a 1% per annum efficiency target on controllable costs;[1] although we note that this is at the high-end of estimated ranges for productivity improvements by utilities over time.
- Any such target would only be applied to controllable costs, and would need to take account of the time required to ramp up efficiency programmes.

...however, an ongoing productivity challenge of up to 1% (e.g. 0.5%) could be considered

[1] For example, Ofgem set a 'core challenge' for ongoing opex productivity of 1.05% for opex in RIIO-2, and an ongoing efficiency challenge of 1% in RIIO-1. The Irish regulator setting a productivity target of 1% per annum for both electricity and gas operators in the most recent decisions.

Contents

This section sets out our tariff benchmarking of GEL, which includes five steps

1. Benchmark GEL tariffs
2. Assess exogenous factors
3. Recommend targeted differentials
4. Assess Affordability Metrics
5. Review fixed vs. variable elements

We collected domestic and industrial tariff data for a set of comparator countries, and compared variable and fixed rates and total bills

Comparators

- Jersey Electricity (JEL)
- Manx Utilities (MU)
- Northern Ireland (NI) electricity suppliers i.e. PowerNI, SSE Airtricity, Budget Energy, Electric Ireland, Click Energy
- Great Britain (GB) default tariff cap and reduced price cap in response to the energy crisis (set by Ofgem)

Industrial tariff comparison is limited to Jersey and Manx due to limited data availability.

Approach

- The benchmarking presented is a one-year comparison using the latest tariffs published for 2022. As a cross-check we also include:
  - the two tariff increases announced by Manx Utilities for April and July 2023; and
  - GEL proposed 2023 tariff increases
- We compare variable and fixed rate individually, as well as total bills and the proportion of fixed charges in total bills.

Key assumptions

Annual usage

- We compare total bills on the basis of average annual consumption provided by GEL.
- We also include scenarios with lower and higher consumption assumptions in Annex 2.

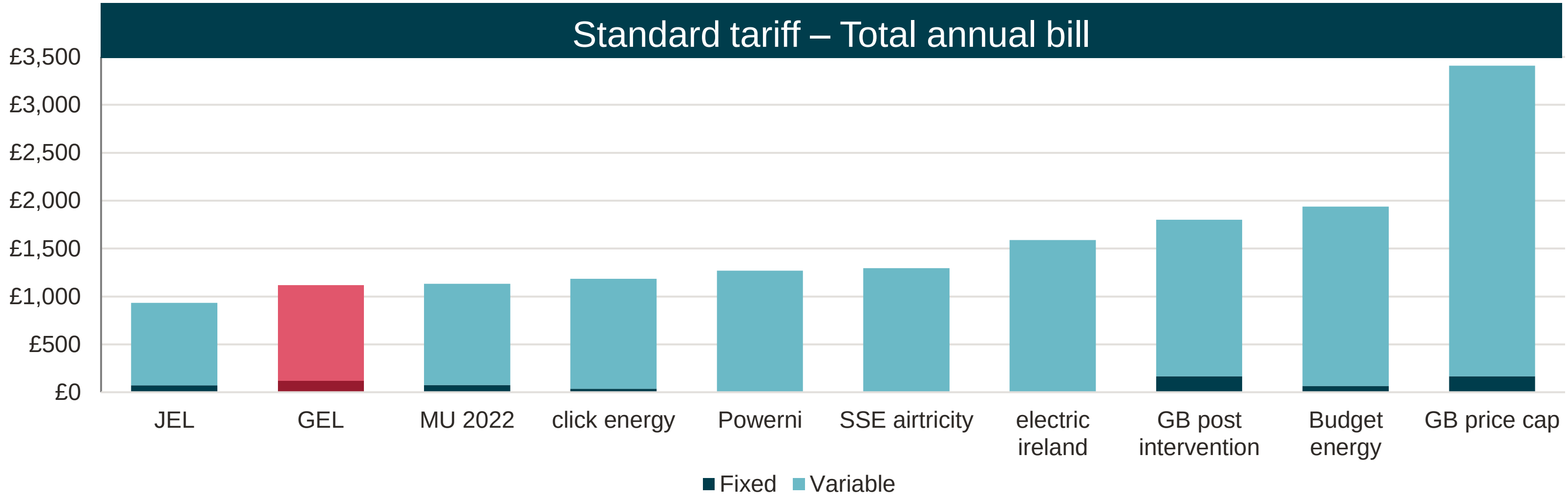
Two rate usage

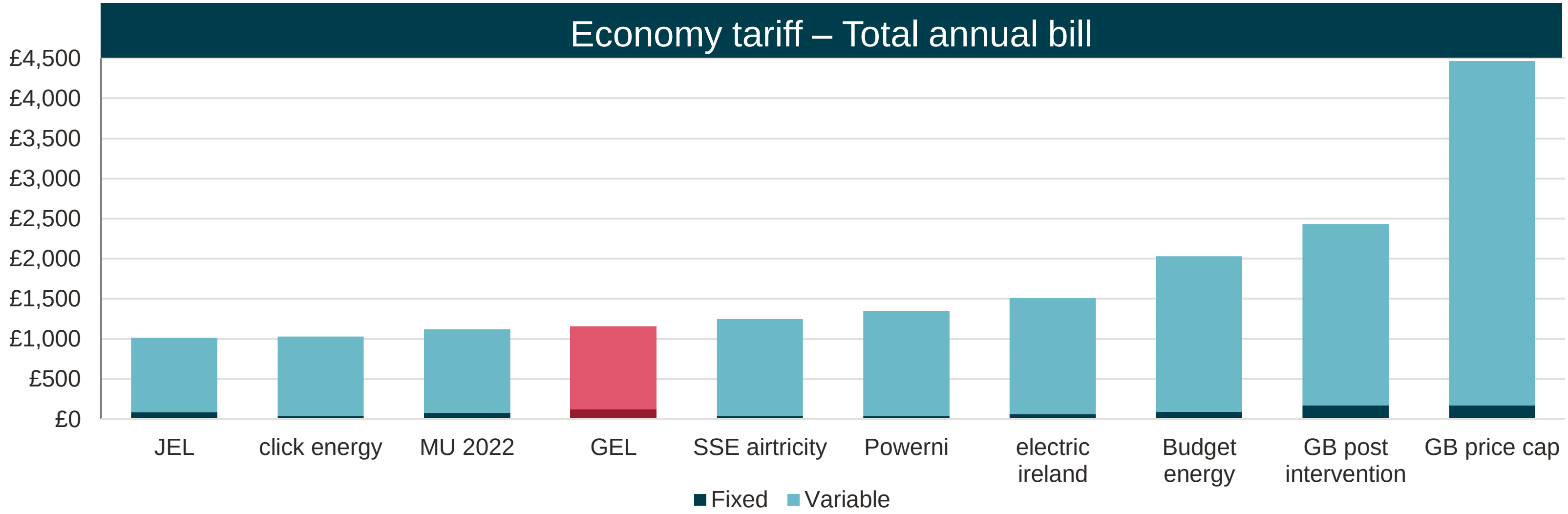
- We compare economy tariffs on the basis of a **high:low rate usage split of 54:46** (based on 2021-22 data provided by GEL).
- We understand that the GEL two-rate tariff offers more hours of low rate than other suppliers (12 vs 7-8 hours).
- We checked data from MU, which shows a similar high:low rate split.
- We lack data for other companies, but scenario tested different splits.

GEL's 2022 domestic total bills were lower than MU but higher than JEL ...

Domestic tariffs

- **GEL's domestic total bills are at the lower end of the benchmark** (above JEL and below MU).
- **GEL has one of the lowest variable rates and one of the highest fixed rates in the domestic rate benchmark**.
- GEL's high fixed rate and lower variable rate (relative to comparators) result in a **higher fixed tariff proportion in total bill compared to other suppliers.**



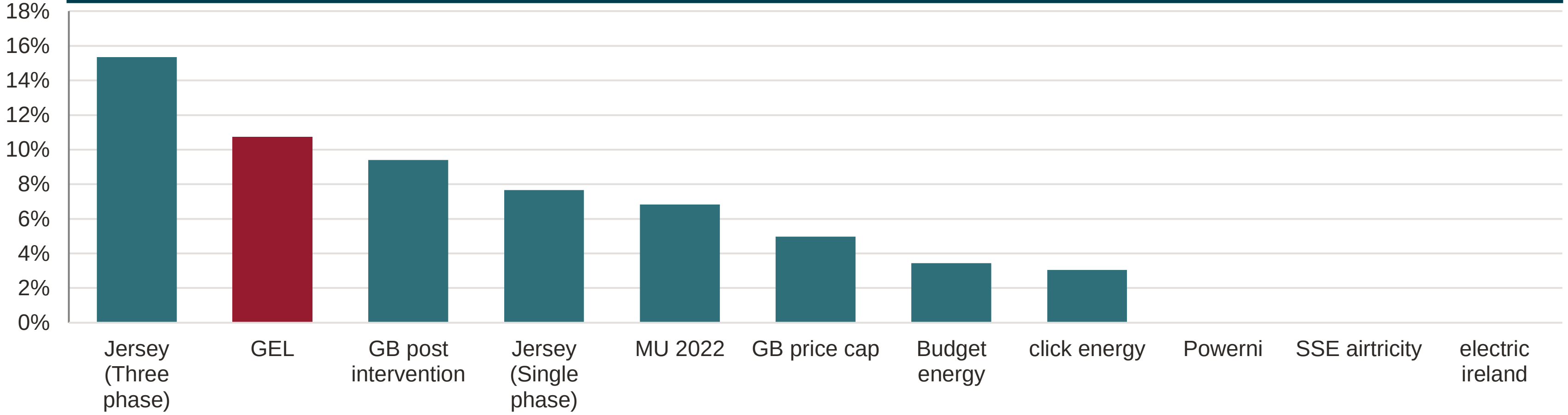


...with a relatively high fixed component relative to comparators for GEL 2022 tariffs

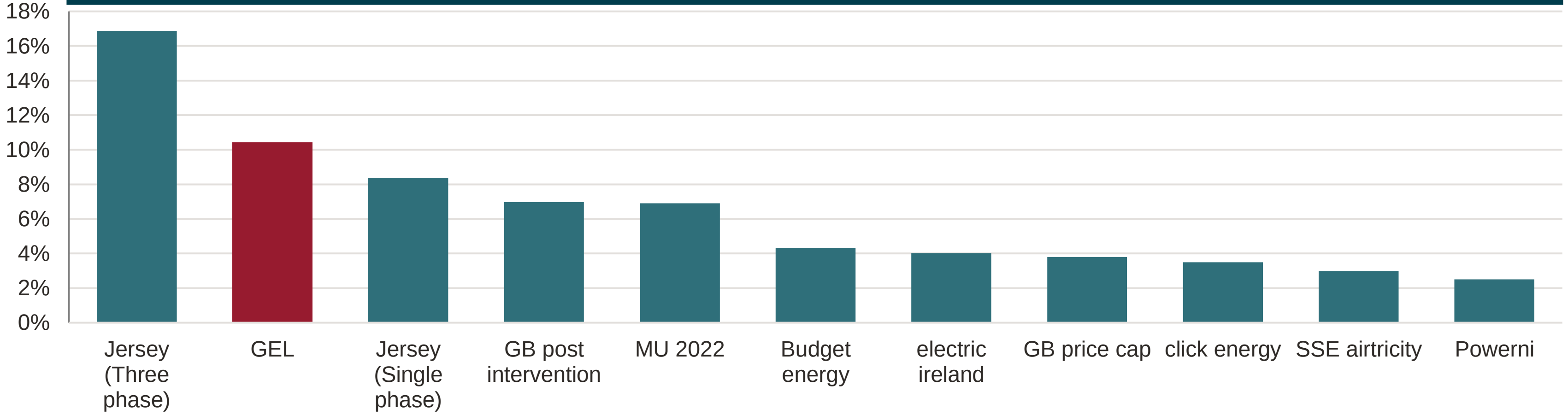
Domestic tariffs

- The combination of GEL's relatively low variable rate and high fixed rate results in a higher fixed tariff proportion compared to other suppliers (apart from Jersey Electricity three phase connection).
- We note that GEL has stated that it is ahead of JEL and MU in relation to a shift towards a higher fixed %.

Standard tariff – proportion of total bill that is fixed



Economy tariff – proportion of total bill that is fixed

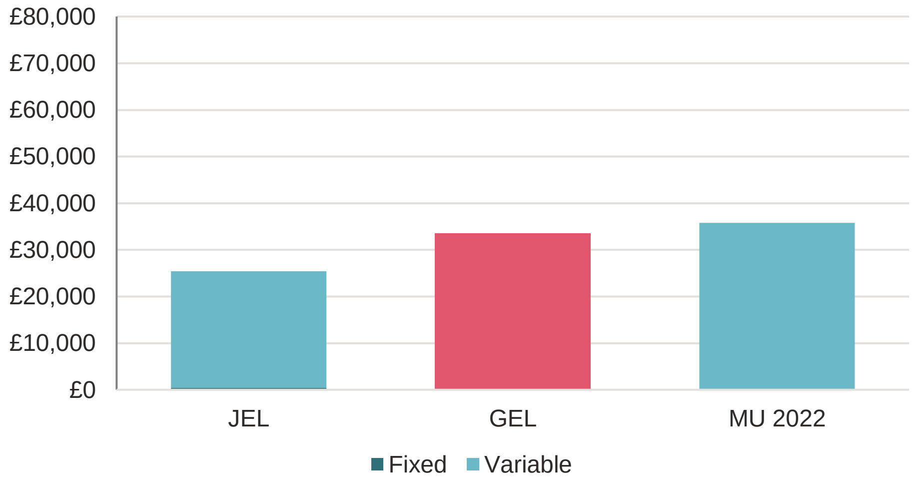


GEL's 2022 industrial total bills are higher than Jersey Electricity but lower than Manx Utilities

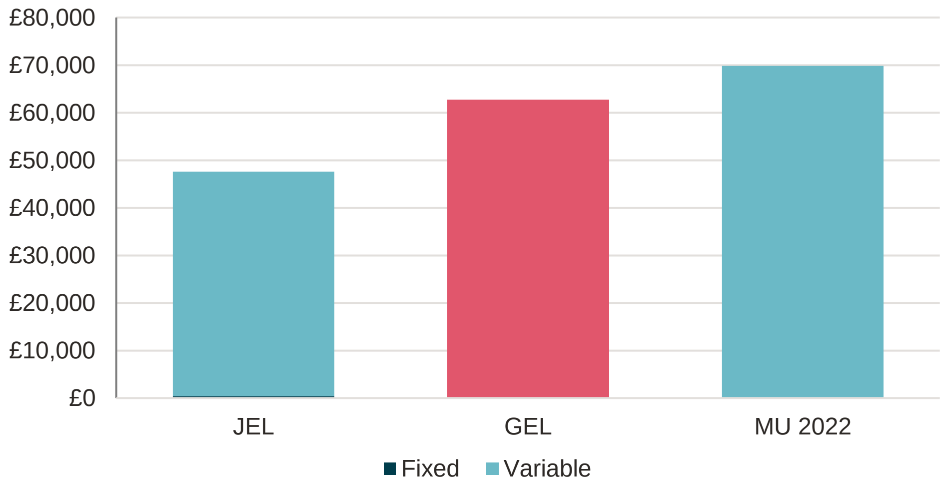
Industrial tariffs

- GEL variable rates are lower than MU but higher than JEL, and unlike others, GEL does not apply a fixed daily standing charge[1].
- This means that **GEL's industrial total bills are lower than MU but higher than JEL for both high and low voltage customers**.

Maximum demand tariff (low voltage) – Total bill



Maximum demand tariff (high voltage) – Total bill

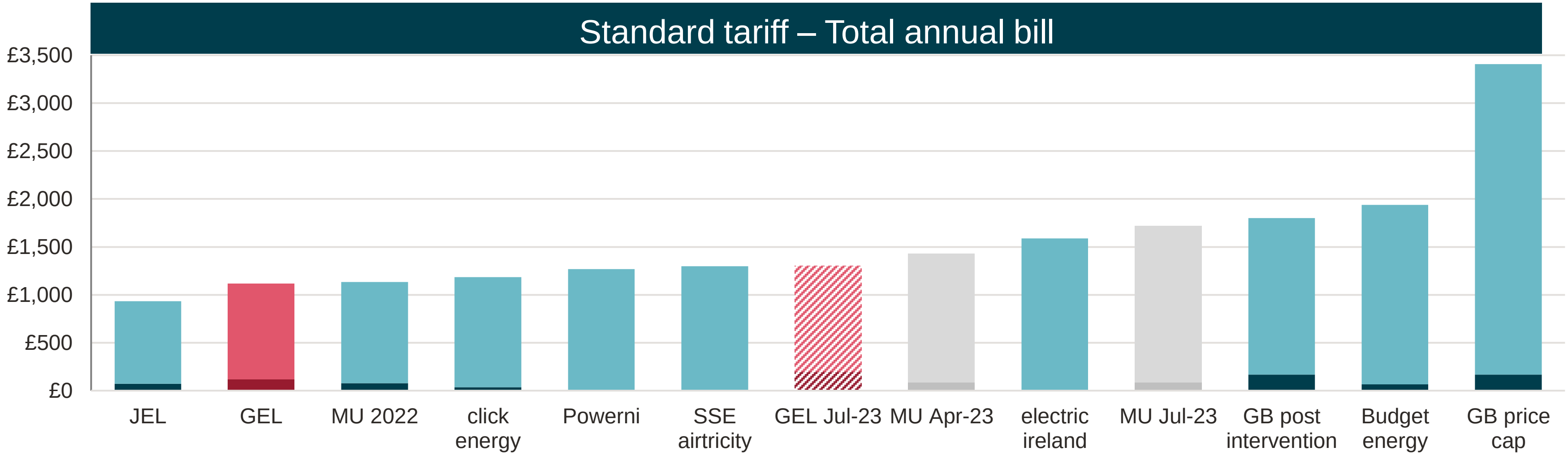


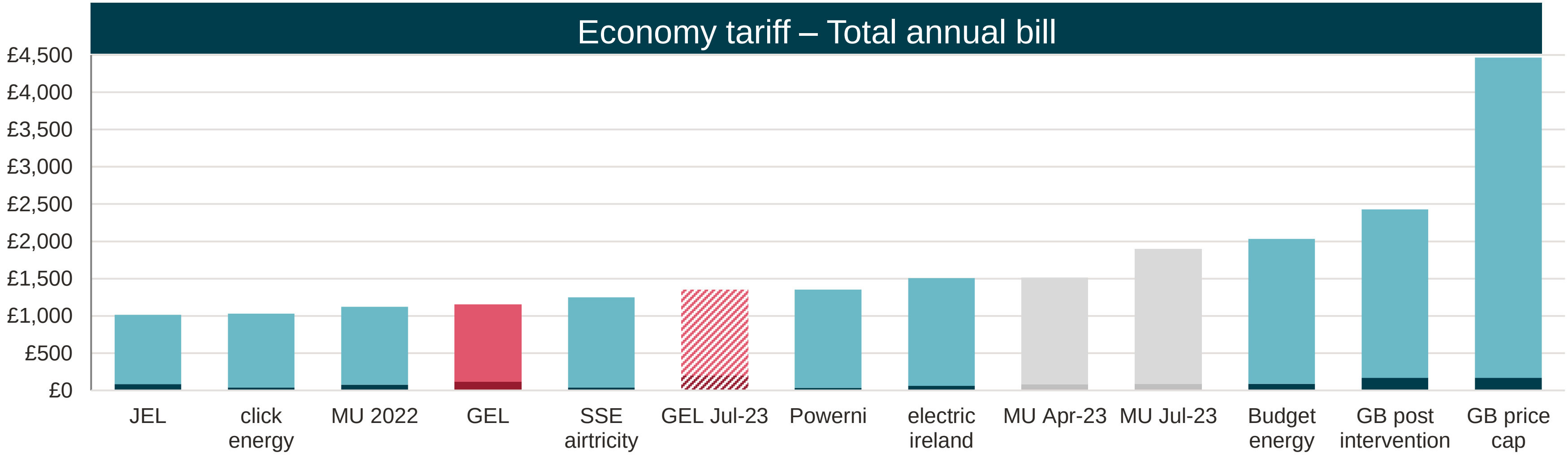
[1]*Note that we do not consider max demand charges or capacity related charges, but only daily standing charges.*

GEL's proposed 2023 domestic tariffs would place it in the middle of the benchmark, above JEL's 2022 tariffs but below MU's 2023 tariffs

Domestic tariffs

- GEL proposed an increase of c.11% on its variable domestic rates, and 65% on the fixed rate for July 2023
- This increase would place GEL's total bill in the middle of the benchmark
- GEL's standard tariff domestic total bill would be above JEL 2022 tariffs (+40%) and below MU recently announced July 2023 tariffs (-32%)

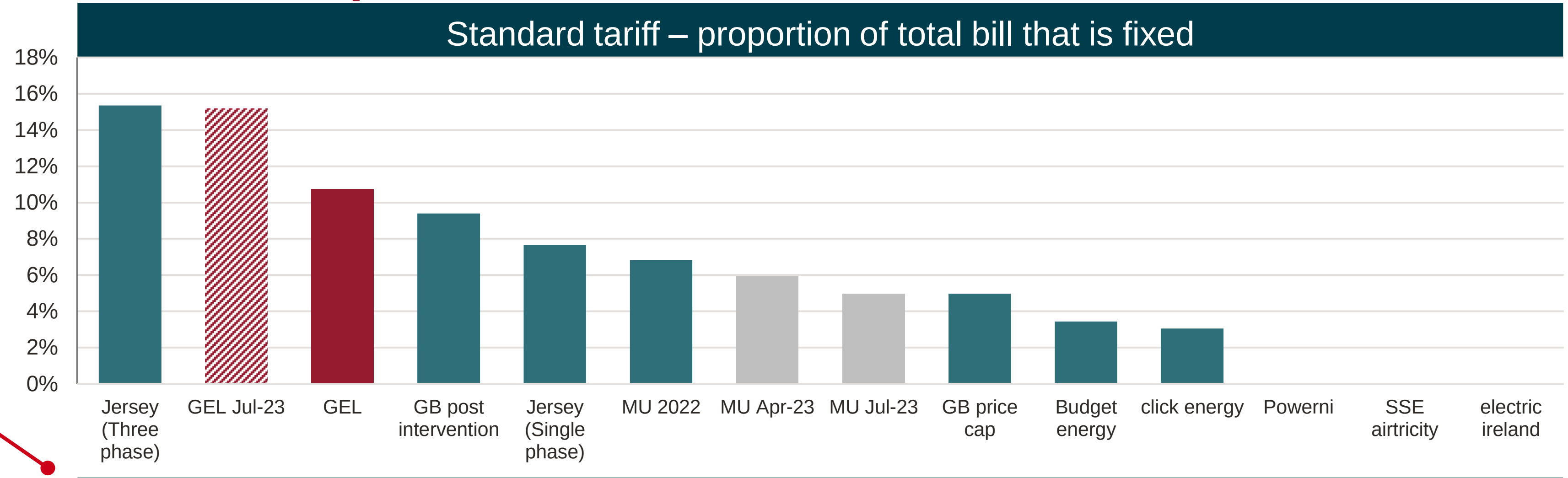


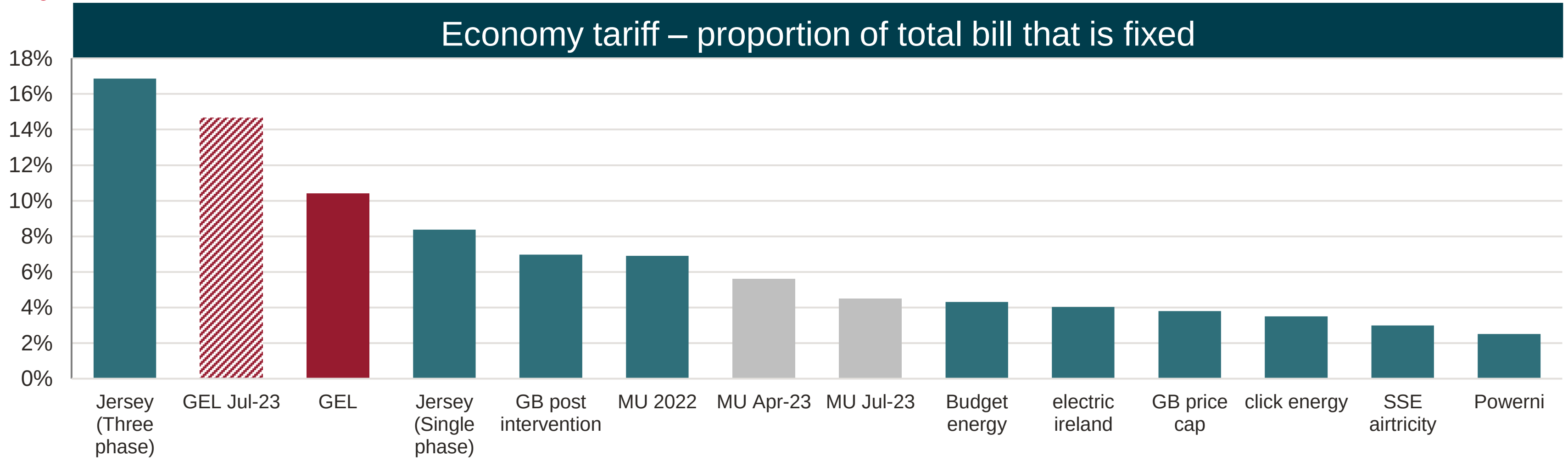


*Note that we do not have any information on how JEL's tariffs may change in 2023

GEL's proposed 2023 domestic tariffs will further increase the fixed component of total bills relative to comparators

- GEL **proposed a 65% increase in fixed rate** (from £30 to £49.5 per quarter), **compared to an increase of c. 11% in the variable rate**.
- **This results in a higher share of fixed charges in total bills** compared to current tariffs.
- GEL's proposed 2023 domestic tariffs **would make GEL's proportion of fixed charges in total bill similar to that of Jersey's three phase connections**, the highest in the benchmark.





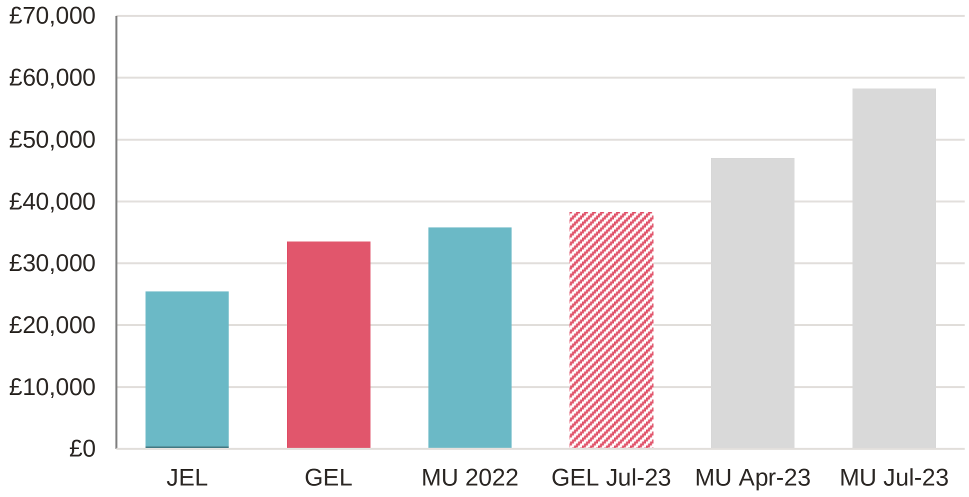
*Note that we do not have any information on how JEL's tariffs may change in 2023

GEL's proposed 2023 industrial tariffs would be between JEL's 2022 tariffs and MU's 2023 tariffs

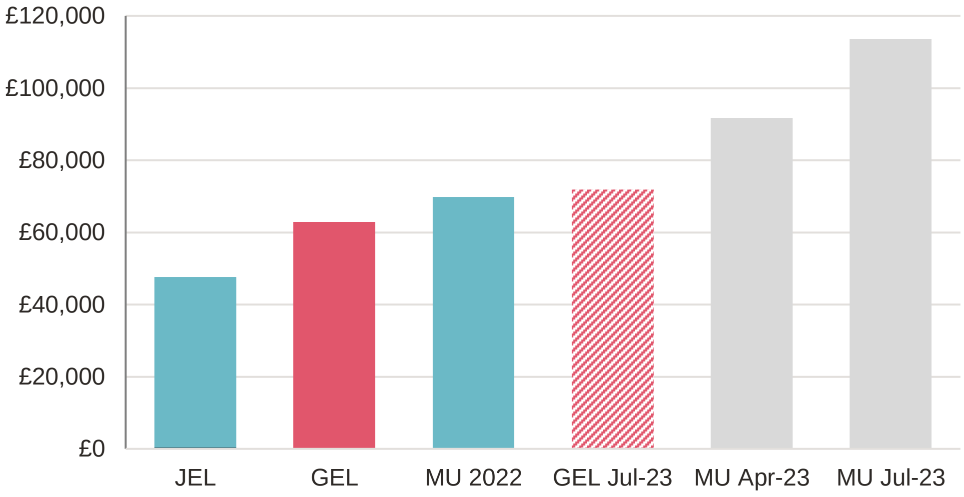
Industrial tariffs

- GEL proposed 2023 variable rates are still lower than MU 2023 but higher than JEL, and unlike others GEL does not apply a fixed daily standing charge[1].
- This means that **GEL's 2023 industrial total bills will be lower than MU 2023 but higher than JEL for both high and low voltage customers**[2].

Maximum demand tariff (low voltage) – Total bill



Maximum demand tariff (high voltage) – Total bill



[1]*Note that we do not consider max demand charges or capacity related charges, but only daily standing charges.*
[2]*Note that we do not have any information on how JEL's tariffs may change in 2023*

We recommend a focus on cost reflectivity of tariffs rather than targeted differential between GEL and JEL tariffs

We understand that **historically a targeted differential between the overall average prices paid by GEL and Jersey Electricity** customers was established. For example, the GEL Electricity Tariff Change Application, May 2022 noted that "the previous benchmarking target set by the Shareholder … required a reduction in the price differential from the initial 17% variance in 2014 to 11%". GEL shared draft data with Frontier which suggests that this difference is now lower (c.6% by March 2023)*.

There are a number of **differences between GEL and Jersey Electricity** that could be driving the tariff differential. For example, as noted in the cost benchmarking section, GEL and JEL face different cost drivers and regional wages. In addition, companies in different countries have differing policy objectives. For example, GEL is currently operating a zero dividend arrangement (in line with STSB policy), which could potentially impact on how tariffs are set. Timing of tariff increases also add an additional challenge in direct comparisons.

Commonly regulators seek to ensure that tariffs are **cost reflective** (as well as other criteria such as ensuring tariffs are non-discriminatory, fair, practical to implement, in line with wider policy objectives). That is, ensuring that tariffs are set at a level where a company can recover its overall **efficient cost level** (including an appropriate return on capital). Tariffs that facilitate cost recovery help ensure the sustainability of the business for all customers and reduce the risk of unacceptably high charges in the future.

Therefore, we recommend that future assessments focus first on **assessing if GEL's costs are efficient**, and that any additional margin is reasonable. This does not detract from the ongoing importance of benchmarking tariffs as part of the tariff review process. However, the benchmarking results should be considered in the round, rather than to mechanistically set GEL's tariff based on a targeted differential. For example, GEL should be required to provide evidence of why any future deviation in tariffs is efficient and cost reflective before such tariff increases are allowed or disallowed.

**Note that this difference is calculated on overall electricity sales and is not based on differences between specific tariffs (therefore it is not comparable to the analysis included in previous slides).*

The estimated proportion of fuel poor (electricity) households in Guernsey is c. 17%

Approach

- There are several ways to measure fuel poverty (% of income spent on energy costs, surveys etc).
- We use an **expenditure-based measure** due to limited data availability.
  - That is, households are considered fuel poor if they spend more than a given percentage of their disposable household income on energy.
  - We identify this percentage as 6% for electricity consumption.
- We use household net disposable income (net of social security, income tax and housing) for 2019 split by quintiles, as publishes by the States of Guernsey.

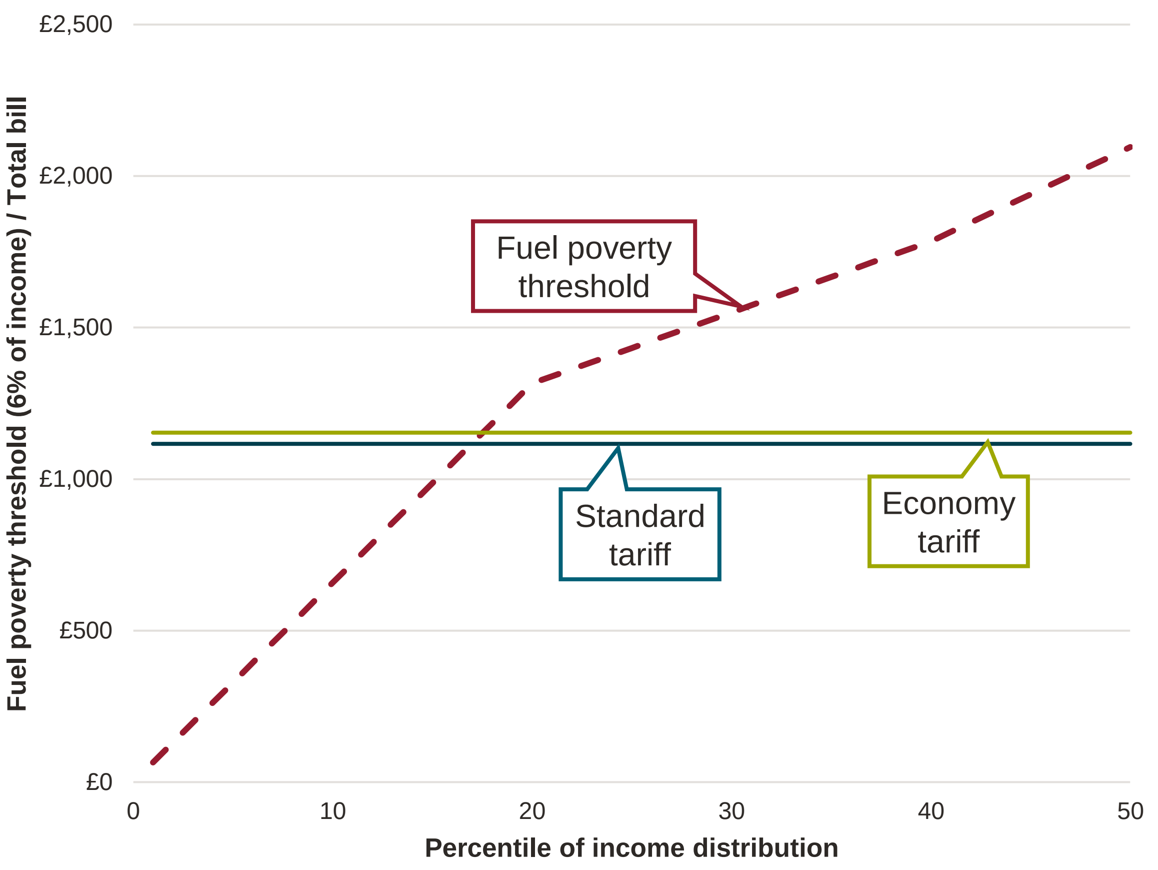
Results

- The analysis suggests that **c. 17% of households** fall below the fuel poverty threshold under current tariffs.

Approach to fuel poverty

- It's important that tariffs are efficient and cost reflective to maintain affordability. However even efficient and cost reflective tariffs are subject to fluctuation as a result of fluctuations in external markets.
- Therefore in many countries, affordability-related interventions typically focus on targeted supports to those in need, such as income support, energy rebates, and specific vulnerable customer tariffs.

Share of fuel poor households (electricity-only)



Latest fuel poverty estimates for other countries are: 13% in England (2022), 25% in Scotland (2019), 14% in Wales (2021), 24% in Northern Ireland (2019), 29% in Ireland (2022). Note that due to differences in approach, timing and data availability these estimates are not directly comparable to that for Guernsey.
Sources: UK data sourced from Gov.uk, Annual fuel poverty statistics report, February 2023. Ireland data sourced from ESRI, Energy Poverty and Deprivation in Ireland Report, June 2022.

Recent developments suggest a shift towards fixed and capacity charges in many countries across Europe

We understand that GEL is increasing the fixed component of tariffs over time. Therefore we report on practices in other jurisdictions on the use of fixed and variable tariffs and how this is evolving, in particular in light of the energy transition.

Although there is significant variance in the structure of electricity distribution tariffs across countries, the direction of travel for tariff changes is similar, with a shift from volumetric to fixed and capacity charges. However customer impact assessments needed to assess potential impact on low income and fuel poor households.

Belgium (Flanders)

- On 1 January 2023, a new capacity tariff entered into force in Flanders, Belgium. Prior to this the distribution charge was estimated based on kWh consumed. From 1 January 2023 this energy component will represent only 20% of the tariff, with the remaining 80% based on peak capacity.

Spain

- Spain shifted from largely volumetric to largely capacity-based tariffs for all customers between 2013 and 2014. This addressed revenue under-recovery as the charges for the previously dominant volumetric element could be reduced through onsite generation.

Netherlands

- 100% fixed capacity charge for households implemented in 2009. Residential customers are divided into different segments according to their connection intensity (and therefore implicitly the power required). They are therefore not all subject to the same tariff (the higher the connection intensity, the higher the fixed tariff).

Italy

- Between 2017 and 2019 Italy implemented a capacity-based network tariff for households (no volumetric component). This was a departure from the increasing consumption-block tariff structure ("progressive tariffs") that had been in place for the previous decades.

*Beyond the countries included in this report who have already increased the fixed component of tariffs, we are aware of other countries that are actively pursuing a shift towards a greater share of fixed charges, for example in the Republic of Ireland. We also note that in the UK, the residual charging review also identified fixed charging as the basis of the new charging regime, which was implemented for distribution charges in April 2022 and due to be implemented for transmission charges in 2023.

Conclusion: GEL's total bills are generally lower than most suppliers apart from JEL, however there are differences between GEL and JEL

GEL's total bills tend to be lower than most other suppliers, and higher than JEL for both domestic and industrial customers.

- There are a **number of differences between GEL and JEL**. These non-efficiency reasons can results in differences in tariffs.
- For example:
  - GEL's smaller scale;
  - GEL's less dense network;
  - regional wage differences; and
  - transmission and distribution losses; and
  - differences in security of supply. GEL.

- **Commonly regulators seek to ensure that tariffs are cost reflective** (as well as other criteria such as ensuring tariffs are non-discriminatory, fair, practical to implement, in line with wider policy objectives).
- Therefore, going forward we recommend that future assessments focus first on **assessing if GEL's costs are efficient, and that any additional margin is reasonable** (rather than just a focus on the differential between GEL and JEL tariffs).
- In addition, we recommend that future assessments also **consider the customer impact of potential tariff increases (from an affordability /fuel poverty perspective)**.

The analysis also suggests that GEL has a relatively high proportion of domestic fixed charges compared to the comparators included. From conversations with GEL we understand that in recent years GEL has started to increase the fixed proportion for domestics, while JEL and MU have not started this transition yet. GEL's move towards a higher fixed proportion is in line with recent developments across Europe, where there has been a shift towards fixed and capacity charges (and a reduction in the proportion volumetric charges) in many countries (e.g. Flanders, Netherlands, Spain, Italy).

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Annex - Contents

Network Security Standards: Differences in Network Security Standards can impact companies' costs...

Security of supply standard in use

- We understand that GEL, JEL and MU all operate under an "N-minus" security of supply standard. This security standard indicates how many of the largest sources of supply can be unavailable before the network stops being capable to guarantee supply.
- For example, N-2 means the company has to ensure it has sufficient supply to meet maximum demand with its two largest sources of supply simultaneously unavailable.

Differences between companies

- While all three companies follow a similar principle in setting the security standard, there are some differences.
- For example, GEL follows an N-2 security standard, but this does not cover the largest source of supply (the interconnector).
- While JEL follows an N-1 standard (i.e. withstand loss of largest interconnector), but has to also withstand the loss of the largest diesel/gas plant, as well as 75% of peak winter load.

Company	Security standard	Includes interconnector?
GEL	N-2	No.
JEL	N-1 and 75% of peak winter load	Yes, as well as largest diesel/gas plant.
MU	N-2	Yes.

...however these differences are complex, and their impact on costs is not clear

Sources:
States of Guernsey's "Energy Policy 2020-2050",
Isle of Man, Appendix 4 ("Future Energy Scenarios") of the Consultation on the Climate Change Plan 2022-2027,
Jersey Electricity, "Investment to power a sustainable future".

Sensitivity testing: We run four scenarios to assess the robustness of our main findings

1 Alternative definition of CSV

- The assumption on weighting of CSV used for the main benchmark of this report assigns a greater weight to "network length" (50%) than "customer numbers" and "throughput". This is because the latter are highly correlated.
- However, we also tested a scenario that applies the same weight to each cost driver (33%) when constructing a CSV. This is to assess the sensitivity of results to the weight assumptions applied to cost drivers.

2 Exclusion of 2021/22 data

We run a sensitivity which excludes the year 2021/22 from benchmarking.

- **This is because the year 2021/22 contains preliminary data for GEL.**
  - GEL pointed out that the data it provided for the year 2021/22 is preliminary and subject to change.

3 No RWA adjustment

- We include results without adjusting for real wages differences, as there are differences in how wage data is published across countries.

4 Transmission losses

- We include results accounting for differences in transmission losses across networks.
- We use data on transmission losses incurred by GEL. We assume that transmission losses incurred by JEL and MU per km of their interconnectors is the same as that for GEL. From this, we estimate that transmission losses incurred by JEL and MU.
- We run a sensitivity that adjusts GEL's and MU's COGS to account for these differences.
- Our approach to estimating transmission losses for JEL and MU is only an approximation as it does not take into account load and topology which also affect transmission losses. However, GEL has not been able to provide us with more accurate estimates, nor were we able to source this information from the publicly available sources.

Glossary of technical terminology

Terminology	Definition
Vertically integrated utility	▪ Utility companies that own all levels of the supply chain: generation, transmission and distribution.
Opex, Capex and Totex	▪ **Opex**: operational expenditure, an expense that a business incurs through its normal business operations. ▪ **Capex**: capital expenditure, funds used by a company to acquire, upgrade, and maintain physical assets such as property, plants, buildings, technology, etc. ▪ **Totex**: total expenditure, given by operational expenditure + capital expenditure.
Throughput	▪ Amount of energy delivered through the network.
CAGR	▪ Compounded annual growth rate, the yearly growth rate assuming to compound values at each year.
HICP	▪ Harmonised Indices of Consumer Prices, measures the changes over time in the prices of consumer goods and services acquired by households. A measure for inflation.
UMAX	▪ GEL’s new Enterprise Resource Planning implementation. A software used by companies to manage key parts of operations, including accounting and resource management.