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24 March 2016

Ms. Keston Ruxton
Manager, Input Methodologies Review
Regulation Branch
Commerce Commission
PO Box 2351
Wellington 6140

Dear Keston,

This submission contains our comments on Dr Lally's "Review of WACC Issues" paper dated 25 February 2016 for the Input Methodologies review. In this submission we will use the terms "MDL", "we", "us" or "our" to refer to the Gas Transmission Business of Maui Development Limited.

Our comments are limited to the first topic addressed by Dr Lally, namely, the asset beta uplift for GPBs relative to EDBs.

Summary

Dr Lally no longer favours an asset beta uplift for GPBs relative to EDBs. We believe there are significant shortcomings in Dr Lally's analysis and do not agree with his conclusion.

The main points we would like to make are as follows:

- Dr Lally underplays the systematic risk GTBs face with respect to gas use as a feedstock in petrochemicals production
- Dr Lally fails to recognise the systematic risk GTBs face with respect to gas use for variable thermal generation
- Dr Lally's calculations relating to exposure to industrial and commercial customer demand underestimate the differential between electricity and gas

These points correspond to the three reasons Dr Lally put forward in his 2004 report[1] in support of an uplift. The first two – which we will refer to as the 'petrochemicals justification' and 'variable generation justification' – were omitted from Dr Lally's 2016 paper, without explanation.

For reasons set out in this submission, we submit that, contrary to Dr Lally's conclusion, the systematic risks GPBs face have not decreased since 2008.[2] Rather, they have increased.

We also submit that:

- Gas transport remains an inherently more risky activity than electricity transport, because gas is a fuel of choice.
- GPBs face higher systematic risk because they have a relatively higher exposure to industrial/commercial users, which have a higher income elasticity of demand than residential users.

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1 Martin Lally, The Weighted Average Cost of Capital for Gas Pipeline Businesses, 14 May 2004

2 That is, since the time Dr Lally submitted his second report: Martin Lally, The Weighted Average Cost of Capital for Gas Pipeline Businesses, 28 October 2008

Taking Dr Lally's equations and posited values (2016, p.7) as a starting point, we have undertaken our own modelling of the asset beta impact of exposure to industrial and commercial users (in this submission, referred to as the IC justification). Our assumptions and results are set out in the final section of this submission. In summary, we found that the current GPB asset beta can be justified exclusively on the basis of the IC justification, before others are taken into account.

Gas-fired thermal generation has become increasingly variable (and has accounted for a decreasing proportion of total gas demand) since the Commission carried out its assessment in 2010. Both trends have increased systematic risk for a GTB – and therefore the variable generation justification has strengthened.

In view of this we submit that the Commission should consider increasing the uplift for GPBs.

Dr Lally underplays the systematic risk GTBs face with respect to gas use as a feedstock in petrochemicals production

Dr Lally observed (2008, p.62) that "a large proportion (30%) of gas is used as an intermediate product in the petrochemical industry, in particular for the production of methanol. This points to a higher income elasticity of demand for gas, and therefore for gas pipeline services."

He continued (pp.62-63): "However, there are two mitigating factors here. First, virtually all methanol is exported. This fact will lower the correlation between the demand for this product and the return on the New Zealand market portfolio. Thus, the impact of gas being used in methanol production upon the asset beta of the pipeline businesses will be mitigated. Secondly, despite the fact that 30% of gas is used in the petrochemical industry, very little revenue arises from this, because the distance that it is piped is relatively short. Since the revenue contribution is small, the impact upon the overall asset beta will also be small."

Despite the relatively low emphasis Dr Lally placed on this in 2008, it is implicit from his conclusion (2008, p.64) and the Commission's commentary[3] on it that the petrochemicals justification played some part in the decision to use a 0.1 uplift.

Nevertheless it was omitted from Dr Lally's 2016 paper, despite demand from this segment having increased in significance over this period.

- From a volume perspective, it has grown from 30% (Dr Lally's figure) to 50% of total gas demand.[4]
- In 2008 'Methanex gas'[5] accounted for 6% of total Maui tariff revenue; across 2014 and 2015, since the second Motunui train and the Waitara Valley plant were restarted, it accounted for 15% of total Maui tariff revenue. Following the closure of Otahuhu and Southdown, this figure has increased to 20% for the first two months of 2016, though admittedly it is difficult to draw inferences from such a small data set. Regardless, we submit that figures of these magnitude do not support Dr Lally's assertion (2016, p.9) that gas going to Methanex "contributes little to the revenues of the gas businesses."

Proportionally, these figures will reduce if and when the Colonial transactions bring the transmission network under common ownership. However we note that:

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3 Input Methodologies (EDBs & GPBs) Reasons Paper, 22 December 2010, paragraph 6.5.29

4 Concept Consulting, Gas Markets – Emerging Trends, slide 11 (original source: MBIE Energy Data)

5 By this we mean gas transmitted through the Maui Pipeline to the Methanex plants. This was measured by summing deliveries to its three 'Welded Points'.

- Demand for petrochemical products is highly sensitive to macroeconomic shocks (Methanex Corporation, for example, has an equity beta of 2.19[6]).
- Dr Lally makes no mention of Ballance's urea plant, which consumes 7PJ per year (4% of total demand). [7] [8]
- Over the long run, if petrochemical production were to decline, the cost recovery burden would be largely shifted onto other industrial and commercial customers, which are also (relatively) susceptible to macroeconomic shocks, as Dr Lally himself notes.

This also calls into question why, in 2016, Dr Lally has excluded non-energy use demand from his analysis of the IC justification. Dr Lally's point (2008, p.63) that "[t]he supply of gas or electricity to commercial and industrial users constitutes an intermediate product whose demand will be driven by the demand for the final goods and services" applies equally, if not more so, to energy supply to petrochemicals producers.

Further, we disagree with Dr Lally that it follows from the fact that "virtually all the methanol is exported" (2008, p.62) that methanol demand (and by extension, Methanex's demand for gas transmission) is weakly correlated with macroeconomic shocks that affect the New Zealand share market.

- Methanex's output is closely related to world methanol prices (and indirectly, to overseas gas prices), which has a close relationship with world oil prices, which in turn have a close relationship to the New Zealand share market (and GDP).
- In passing we also note that the exported proportion has reduced from 98% (in 2008) to 95% (in 2016).

Dr Lally fails to recognise the systematic risk GTBs face with respect to gas use for variable thermal generation

In 2008 Dr Lally observed (p.63) that "whilst a large proportion of gas is used in the generation of electricity, some of it is used to generate the variable rather than the base supply. If the extent of this variable supply were substantial, then the demand for gas would be more sensitive to macroeconomic shocks than the demand for electricity and this would point to a higher asset beta for the gas pipeline businesses than that for the electricity lines businesses."

As with the petrochemicals justification, he downplayed (2008, p.63) the significance of this on the basis that "most of the gas used for electricity generation is used to supply Otahuhu, TCC and Huntly plants, and these plants generally provide base rather than variable supply."

The variable generation justification was also omitted from Dr Lally's 2016 paper, notwithstanding the significant shift that has taken place vis-à-vis gas' role in the energy mix – from base load to peak supply.

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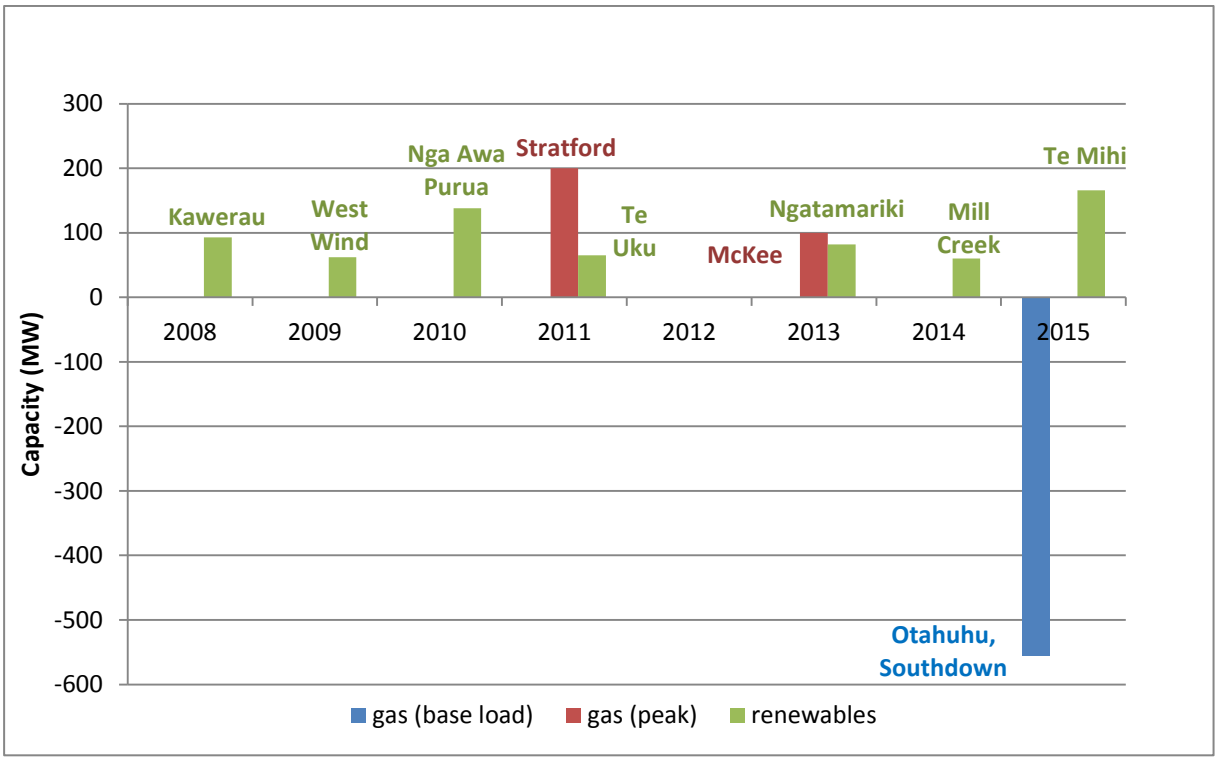
6 https://www.google.com/finance?cid=657291. We have not found a leverage figure and therefore have been unable to un-lever the equity beta to derive an asset beta; nor have we sought to isolate a Methanex New Zealand contribution to the group beta. Nevertheless, we submit the equity beta has a degree of indicative value.

7 Because the plant is located on Vector's SKF line, we have no information about its contribution to tariff revenues.

8 Notably, urea has been identified as "a particularly attractive option" for commercialising any significant new gas finds, "because it would enjoy a relative advantage compared with methanol or ammonia in terms of avoided international shipping costs." Concept Consulting, Possible Commercialisation Options for New Gas Discoveries, February 2015, p.6

This is largely a function of the growth in geothermal capacity, which has doubled in that time, replacing gas as the second largest generation source[9] due to its lower variable operating costs.[10] Additional wind capacity has also come online. Notable (50MW+) developments since 2008 are displayed in Figure 1 below[11]:

Figure 1: Generation capacity added/removed since 2008



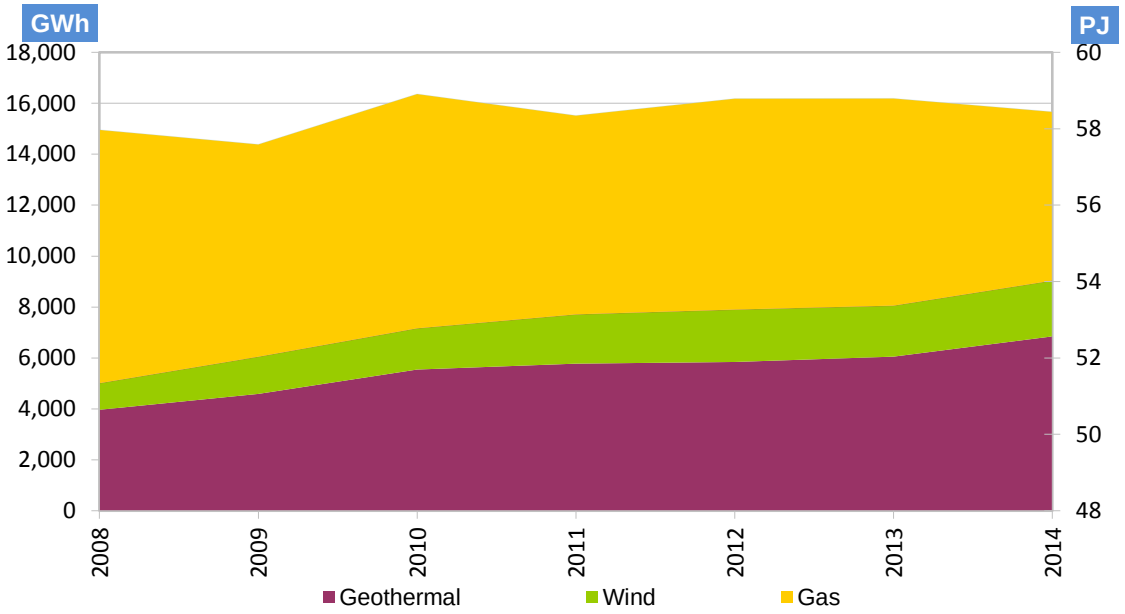
9 MBIE, 2014, p.1: see http://www.mbie.govt.nz/info-services/sectors-industries/energy/energy-data-modelling/publications/energy-in-new-zealand/Energy%20-in-New-Zealand-2015.pdf

10 As Concept Consulting notes, because of their "very low variable costs of operation", geothermal plants "once built, are effectively must-run stations during any given year." Gas Supply and Demand Scenarios: 2014 – 2029, Concept Consulting, p.62

11 The retirement of two of the Huntly units is not displayed, despite the fact that the Rankines can run on coal or gas. This is because, for the most part – aside from exceptional years when take or pay commitments increased gas use – these units were run 90-95% on coal from 2008 onwards, until they were retired in 2012/13.

This gradual displacement of gas with renewables can clearly be seen in Figure 2 below:

Figure 2: Generation output (geothermal, wind, gas (incl. co-generation)): 2008-2014



Gas-fired generation levels relative to total generation (including 2016 projections) are shown in Figure 3 in the Appendix.[12] With Otahuhu and Southdown – which together accounted for 26% of total gas-fired generation output in 2015[13] – removed from the stack, we expect a downturn in thermal generation in 2016, and potentially beyond (though currently this is very difficult to predict with any confidence). As noted in the next section, this increases a GTB's exposure to industrial/commercial users, thereby strengthening the IC justification.

As thermal generators play a more marginal role, peakiness factors increase. Gas-fired stations are dispatched less during 'off peak' hours and have higher variability in the quantities of gas they consume both between half hour trading periods and days. This trend is illustrated in Figures 4, 5 and 6 in the Appendix.

At a more detailed level, the charts offer the following insights:

- There was relatively little volatility when Dr Lally prepared his last report. This was a factor of 2008 being a very dry year, plant configuration at the time, and the relatively smaller role of geothermal in the energy mix.
- From 2009 onwards, there is a clear trend from base load to peak generation. There is a slight uptake in off peak generation mid-period – most pronounced at Otahuhu and Stratford – but these simply reflect dry year dynamics.
- Gas-fired generation volumes have clearly been reducing. Capacity utilisation factors reduce, increasing unit cost per unit of output. This creates a loop effect: as unit cost per unit of output increases, the gas-fired stations fall further down the stack – and their generated volumes continue to reduce.

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12 Steve Bielby, Chief Executive of Gas Industry Company, noted the trend in a recent presentation he made (on 7 March 2016) at the Australian Domestic Gas Outlook Conference: see http://gasindustry.co.nz/dmsdocument/5250

13 Based on publicly available information downloaded from the Electricity Authority's Electricity Market Information website

- The picture for Stratford is somewhat clouded by the combination of TCC and the Stratford peaking station in the EMI data. Together, Figures 3 and 4 show that TCC's base load role has reduced, while the peakers have played a growing role in meeting peak demand.

Dr Lally's industrial/commercial use calculations underestimate the differential between electricity and gas

Dr Lally observes (2016, p.7) that a higher proportion of gas is used by industrial and commercial users than in the case of electricity, but concludes that "the effect is likely to be small." We submit that Dr Lally's conclusion is misinformed by:

- Inaccurate representation of the relative proportions of gas demand that thermal generation and industrial/commercial customers account for.
- The assumption that βp is the same for gas as it is for electricity.

We also submit that:

- The K factor is material, so the Commission should exercise caution when assessing beta values generated by Dr Lally's posited values.
- The Commission should exercise caution before dismissing any observed differentials on the basis that they are "small".

Dr Lally's assumed figure for industrial/commercial demand is unrealistically low

Dr Lally calculates gas use by industrial/commercial customers to be 83% of total demand. In our view his calculations underestimate the true figure, given that:

- Non-energy use gas demand (for petrochemical production) should be included, for reasons highlighted above.
- Dr Lally used 2014 figures, which do not factor in the Otahuhu and Southdown closures. He therefore overestimates the proportion of gas demand accounted for by thermal generation, and – though a portion of that demand factors into the total – thereby underestimates the total industrial/commercial portion of gas demand.

We have carried out detailed modelling in order to generate an estimate that takes these matters into account. The result is a figure of 90.2% of demand relating to industrial and commercial users.

We also carried out research in order to ascertain what might be an appropriate K factor, based on empirical evidence about income elasticity of demand relativity for residential versus industrial/commercial users. Unfortunately we were unable to find useful data.

However, in order to illustrate the impact of the higher IC figure (0.902 vs. 0.83), we calculated asset beta values using (in our view) a plausible range of K factors. The model also uses Dr Lally's electricity figures (0.34 beta; 68/32 IC/residential split).

D(I/C) = 0.902	K						
	2	2.5	3	3.5	4	4.5	5
Asset beta	0.385	0.396	0.404	0.41	0.415	0.418	0.421

Residential gas users are likely to have a higher income elasticity of demand than residential electricity users

We also submit that Dr Lally is wrong to assume that βp is the same for gas as it is for electricity. This is because, as Houston Kemp (on behalf of Powerco) recently noted[14], research into the determinants of residential demand for electricity and gas in Australia has previously shown that the income elasticity of demand for gas is much higher than for electricity. This suggests that, in Australia at least, gas is a "luxury" good, given its demand increases more than proportionately with income. Admittedly we have not tested this conclusion in a New Zealand context, but in principle see no obvious reason why it should not hold.

Accordingly, we posited various multipliers reflecting this differential. The results, otherwise using the same assumptions as above, were as follows:

D(I/C) = 0.902		K						
		2	2.5	3	3.5	4	4.5	5
R	1.050	0.388	0.416	0.424	0.431	0.435	0.439	0.442
	1.075	0.414	0.426	0.434	0.441	0.446	0.450	0.453
	1.100	0.424	0.436	0.445	0.451	0.456	0.460	0.463
	1.125	0.433	0.446	0.454	0.461	0.466	0.471	0.474
	1.150	0.443	0.456	0.465	0.472	0.477	0.481	0.486

These values reflect our estimate of the beta impact of the petrochemicals- and IC justifications. We have not modelled the additional impact that the variable generation might have.

Conclusion

We have appreciated the opportunity to provide these comments. For any additional questions or clarifications please do not hesitate to contact us.

Yours sincerely,

Jamie Patton
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for Maui Development Limited

[14] Houston Kemp, Comment on the Commerce Commission's cost of capital update paper, A report for Powerco, 5 February 2016

Appendix

Figure 3: gas-fired generation amounts are reducing

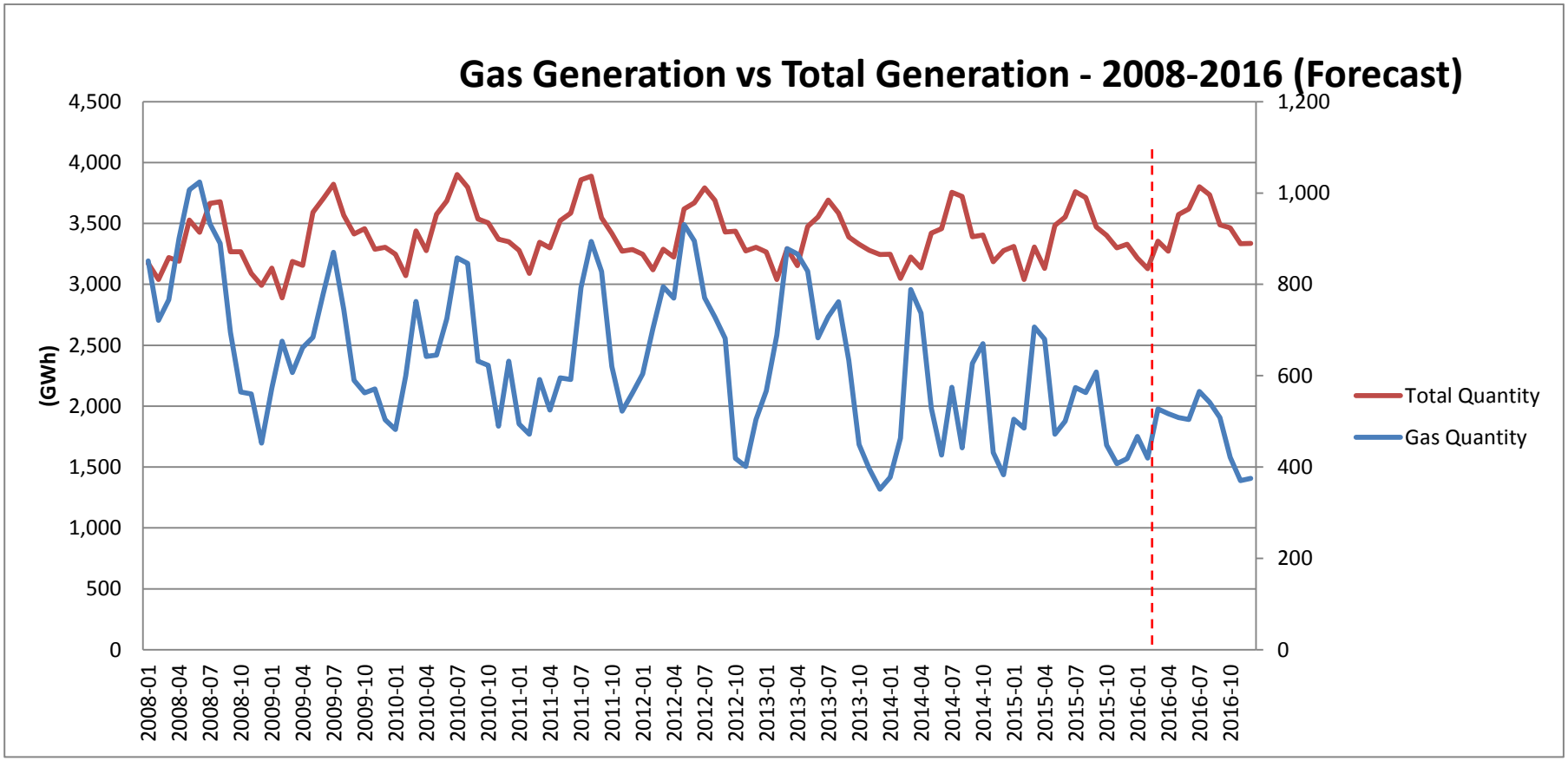

Figure 4: shift from base load to peak generation (all stations)

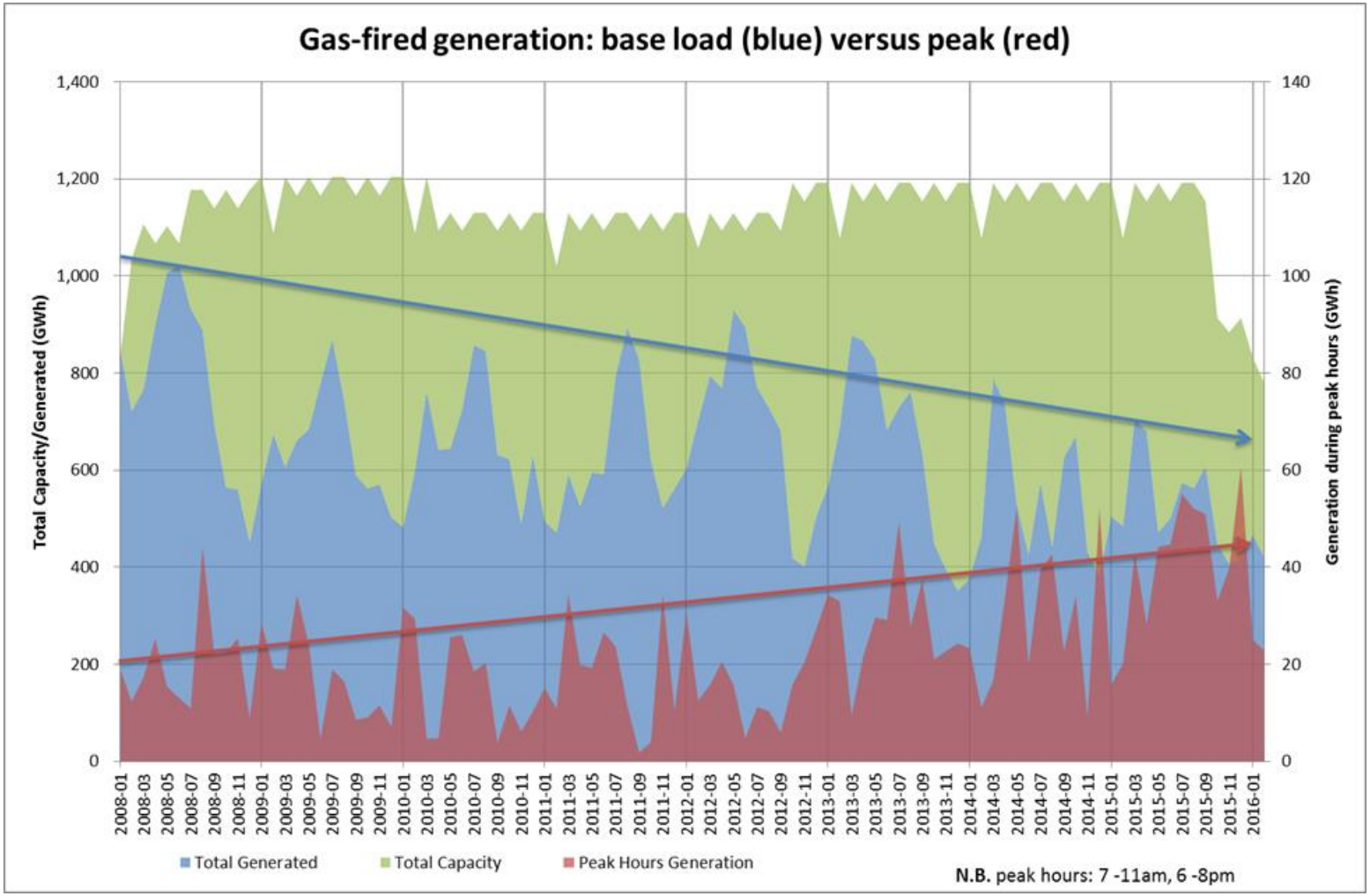

Figure 5: Changes in base load generation (station by station): Morning off-peak hours (pre 6am)

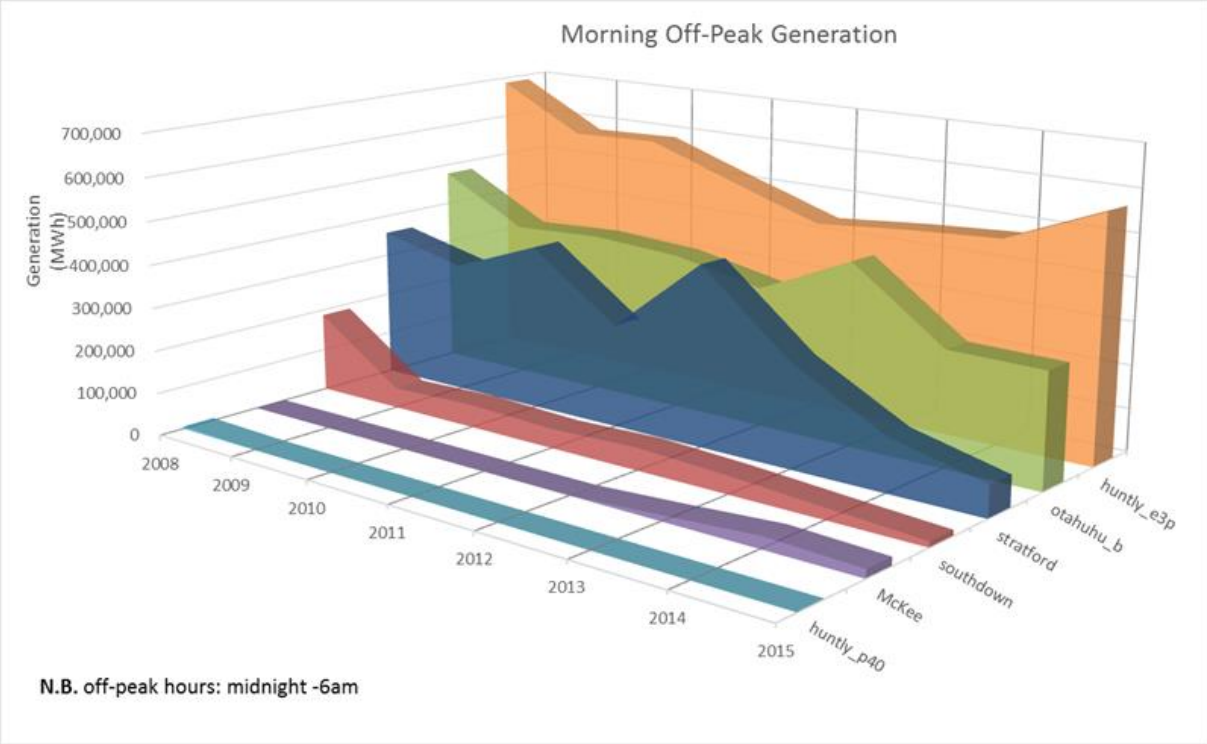

Figure 6: shift from base load to peak generation (station by station): variability of generation against average hourly generation