ONTARIO POWER GENERATION - JOURNEY OF EXCELLENCE

GAP TO BE ADDRESSED: Total Generating Costs per MWh - *Currently $46.92/MWh vs. Median of $41.29/MWh*

BENCHMARKING: Four cost measures (Capital Costs, Fuel Costs, Non-Fuel Operating Costs, and Total Generating Costs) are benchmarked against the North American industry each year.

Streamline Nuclear Processes and Organizational Structure

- Transition to Top-Down Gap Based business planning model in 2009.
- Adopt a centre-led approach to organizational structure, eliminating duplication and redundancy to lower station overhead and support group costs (Pickering A and Pickering B Amalgamation, Initiative EN-02 and Business Transformation.)
- Transition to Day-Based Maintenance at the sites, optimizing execution and reducing maintenance costs.
- Move to an Engineer-Procure-Construct (EPC) model for contracting nuclear projects and overflow work.

Reduce Staff Numbers and Increase Generation

- Benchmark nuclear staff numbers against industry.
- Set aggressive but realistic targets for staff reduction.
- Rely on attrition to achieve staff reduction goals.
- Limit hiring to focused groups and special needs.
- Increase generation at stations by reducing Forced Loss Rate and by reducing the duration of planned outages.

Implement Cultural Change

- Conduct senior management briefings with all staff to ensure understanding of the need for change.
- Deliver Business Acumen training to middle managers, to ensure a solid understanding of cost management principles.
- Brief union leaders on intended improvements and transitions as OPG moves forward.
- Enforce cost accountabilities and reward favourable performance.
- Engage vendors and suppliers in cost optimization strategies.

PROOF WE ARE IMPROVING

- Favourable trends in:
  - Headcount (10% reduction since 2009)
  - Generation (15% increase since 2004)
  - Costs < labour escalation (2% per year)
  - Headcount/TWh (5% reduction since 2009)

LEADS TO

Continuation as Ontario's lowest cost electricity producer.

DESIRED END STATE

- Nuclear fleet Total Generating Cost/MWh at industry median.
- Nuclear staff levels at industry median.
- Stakeholder (CNSC, PWU, Society, OEB) acceptance of cost initiatives.
- OPG Nuclear well positioned for new nuclear projects.

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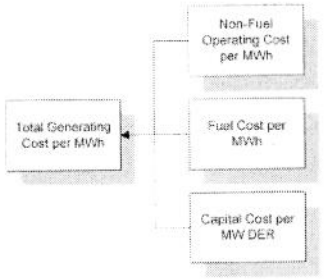
Nuclear Costs

Four "Value for Money" metrics are typically benchmarked. They are Total Generating Costs per MWh (TGC), Non-Fuel Operating Costs per MWh (NFC), Fuel Cost per MWh, and Capital Costs per MW DER. The metrics roll up as shown in the illustration below. Total Generating Cost is the sum of Non-Fuel Operating Cost, Fuel Cost, and Capital Cost. Given the differences between OPG and most North American plants with respect to both fuel costs and capital costs, the best overall financial comparison metric for OPG facilities is Total Generating Cost per MWh.

Figure 1 - Summary Relationship of Value for Money Metrics



Methodology and Sources of Data

Cost data from the Electricity Utilities Cost Group (EUCG)is collected on a three-year rolling average for all financial metrics. All data is automatically converted to Canadian dollars. Effective January 2009 (but applied retroactively), EUCG automatically applies a purchasing power parity (PPP) value to adjust for all values across national borders, to reflect currency exchange rate fluctuations and cross-border factors which may impact purchasing power of companies in different jurisdictions. Therefore, cost variation between plants is limited as much as possible to real differences and not advantages of utilizing one currency over another.

The benchmarking panel utilized for financial metrics is made up of all North American plants reporting to EUCG. Within that panel, there is only one other CANDU technology plant reporting, Bruce Power. Though some of the financial gaps in performance are likely associated with technology differences rather than comparable performance, the comparison is very useful. TGC and NFC are normalized by generation output (MWh) to allow a more accurate comparison across plants of different sizes and numbers of units.

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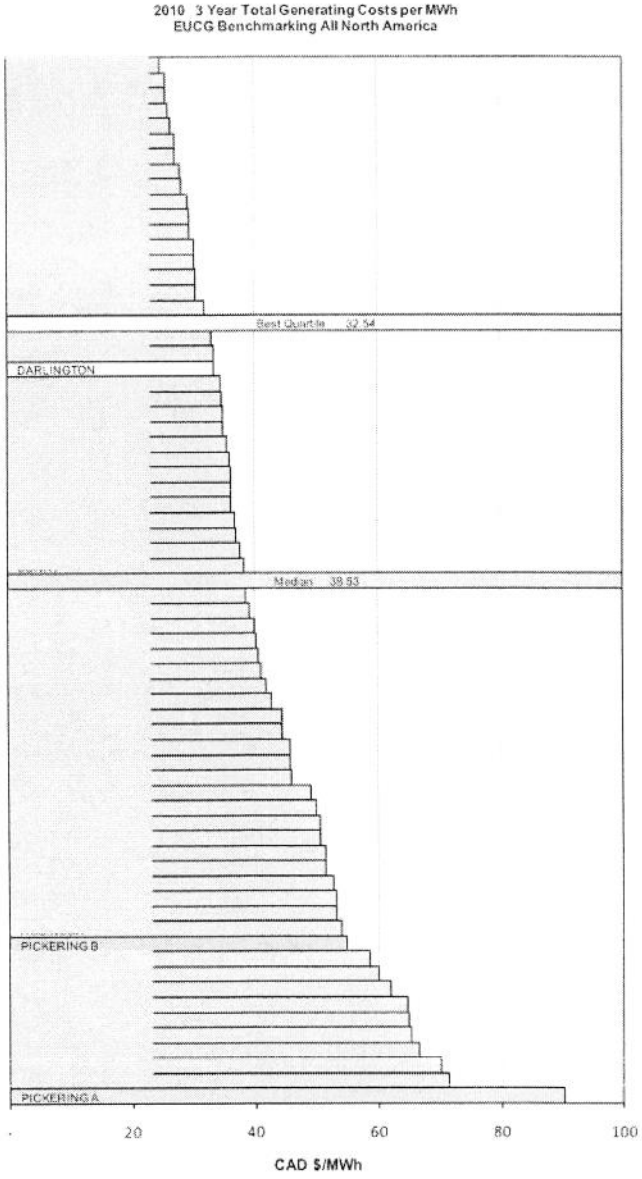
Figure 2 - 2010 Total Generating Costs per MWh



- The best quartile level for total generating costs per MWh among North American EUCG participants was $32.54/MWh while the median level was $38.53/MWh.
- Pickering A's total generating cost was $90.21/MWh, significantly worse than the median of $38.53/MWh.
- Pickering B's total generating cost was $54.79/MWh, significantly worse than the median of $38.53/MWh.
- Darlington was the only Candu plant in the panel to achieve total costs better than the industry median but did not achieve best quartile.

2011 Darlington results $33.05/MWh which is 1st quartile performance!

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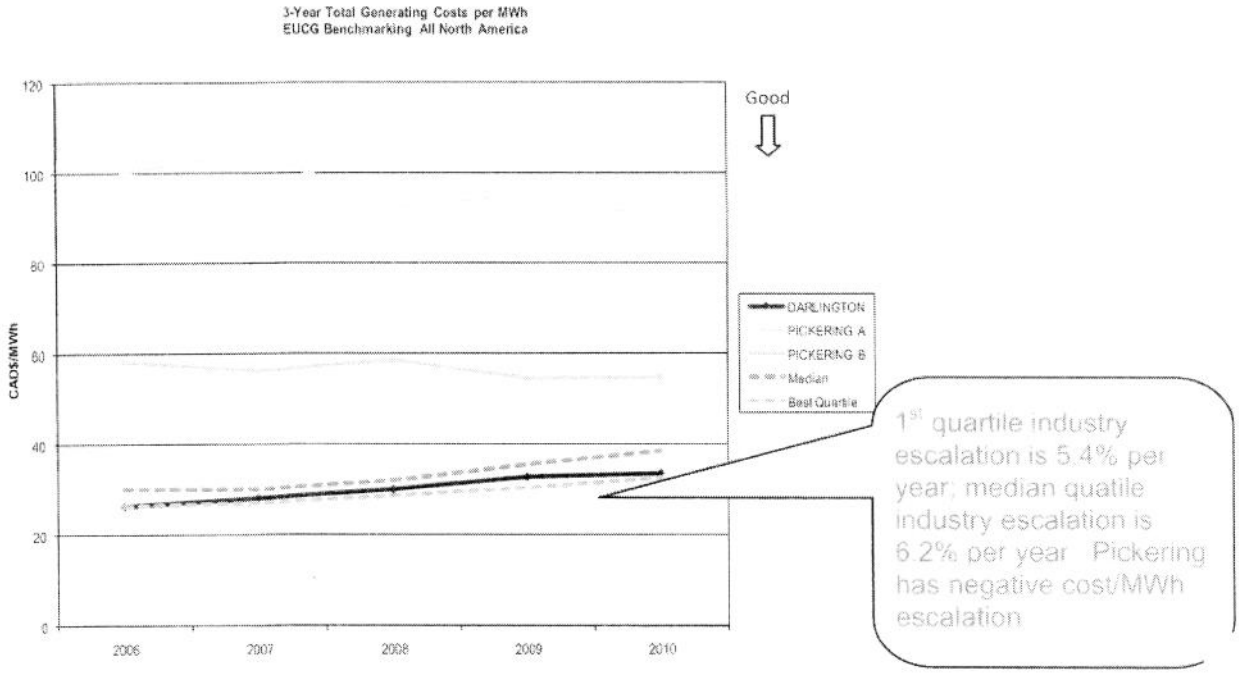
Trends in Total Generating Costs

- Both best quartile and median Total Generating Costs per MWh have increased since 2006. The best quartile cost rose by 24% while the median cost rose by 28%.
- Pickering A's total generation cost per MWh was the highest cost of any station reporting and was $51.68/MWh above the 2010 median. Costs have decreased over the period by $10.12/MWh, mostly due to improved electricity production.
- Pickering B's costs have decreased by $3.89/MWh since 2008 reflecting improved electricity production and cost reduction initiatives. Pickering B's costs are still above the median.
- Darlington's costs trended upward over the review period. In 2006, they were very close to the best quartile level, moving closer to median from 2007 to 2009 and almost reaching best quartile performance in 2010. The growth during this period was $7.14/MW mostly due to higher base and outage OM&A offset by lower Corporate allocations. The execution of a Vacuum Building Outage in 2009 and two planned outages in 2010 contributed to the average increase in cost over this period.

Figure 3 - Trends in Total Generating Cost per MWh



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Factors Contributing to TGC Performance

- For technological reasons, Fuel Costs per MWh are an advantage for all Candu reactors (use of non-enriched uranium), and the OPG plants performed within the best quartile.
- Non-fuel operating costs per MWh for all OPG plants yielded results worse than median for the most recent data point compared to the North American EUCG panel.
- Pickering B and Darlington achieved the lowest capital costs per MW DER of the panel and Pickering A was within second quartile.

Pickering A TGC

- The largest driver of cost per MWh for Pickering A during the review period is a low capability factor; since costs are normalized to generation, forced outages and long planned outages increase the TCG.
- Station size also negatively impacts cost per MWh for Pickering A as it has relatively small units.
- The remaining large drivers of cost performance at Pickering A include Candu technology, impacting the number of staff required, corporate cost allocations, and a VBO during the review period (impacting generation).

Pickering B TGC

- Like Pickering A, the overall largest driver of cost per MWh for Pickering B over the review period is capability factor. Forced losses have improved significantly at Pickering B but longer planned outages driven by inspection program requirements are a main contributor.
- Station size also negatively impacts cost per MWh for Pickering B (primarily driven by relatively small units).
- The remaining large drivers of cost performance at Pickering B include CANDU technology, corporate cost allocations, potential controllable costs, and a VBO during the review period.

Darlington TGC

- The largest drivers of performance gap for Darlington are CANDU technology, corporate allocations, potential controllable costs and a VBO in 2009.
- Due to strong generation performance at Darlington, the capability factor contributes positively to performance.
- Station size actually provides an overall advantage for Darlington (due to 4 relatively large units).

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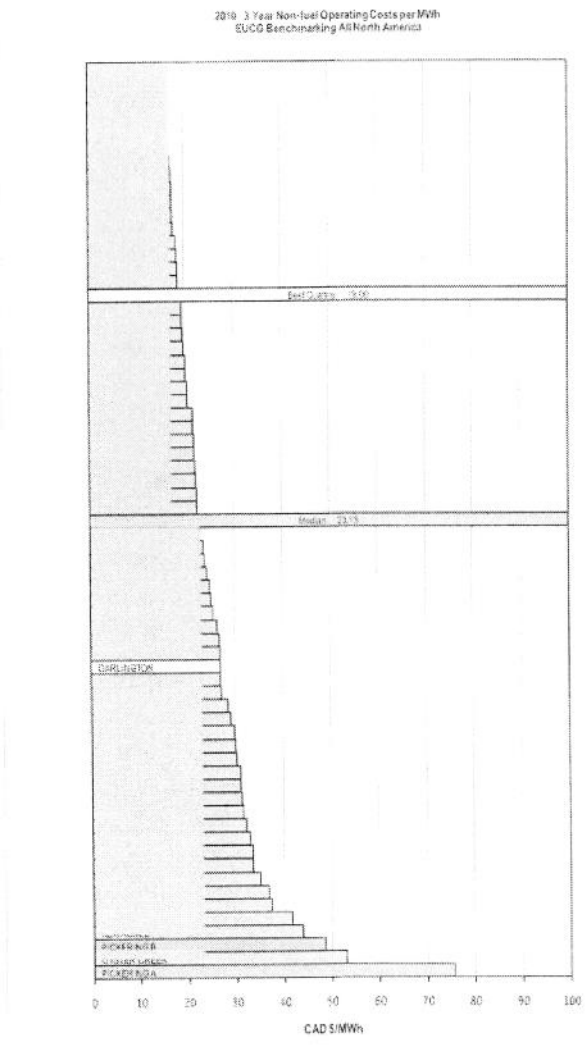
Figure 4 – 2010 Non-Fuel Operating Costs per MWh



- Best quartile plants had non-fuel operating costs better than $19.00/MWh and median plants were better than $23.13/MWh.
- Compared to North American EUCG plants, the non-fuel operating costs per MWh of all participating Canadian CANDU plants were significantly worse than median performance.
- Pickering A at $75.51/MWh was $56.51/MWh higher than best quartile and $52.38/MWh higher than the median.
- Pickering B at $48.49/MWh was $29.49/MWh higher than best quartile and $25.36/ MWh higher than median.
- Darlington's costs at $27.09/MWh were $8.09/MWh higher than best quartile and $3.96/MWh higher than the median.

Darlington's 2011 Non-Fuel Operating costs/MWh is trending better at $2.02/MWh above median

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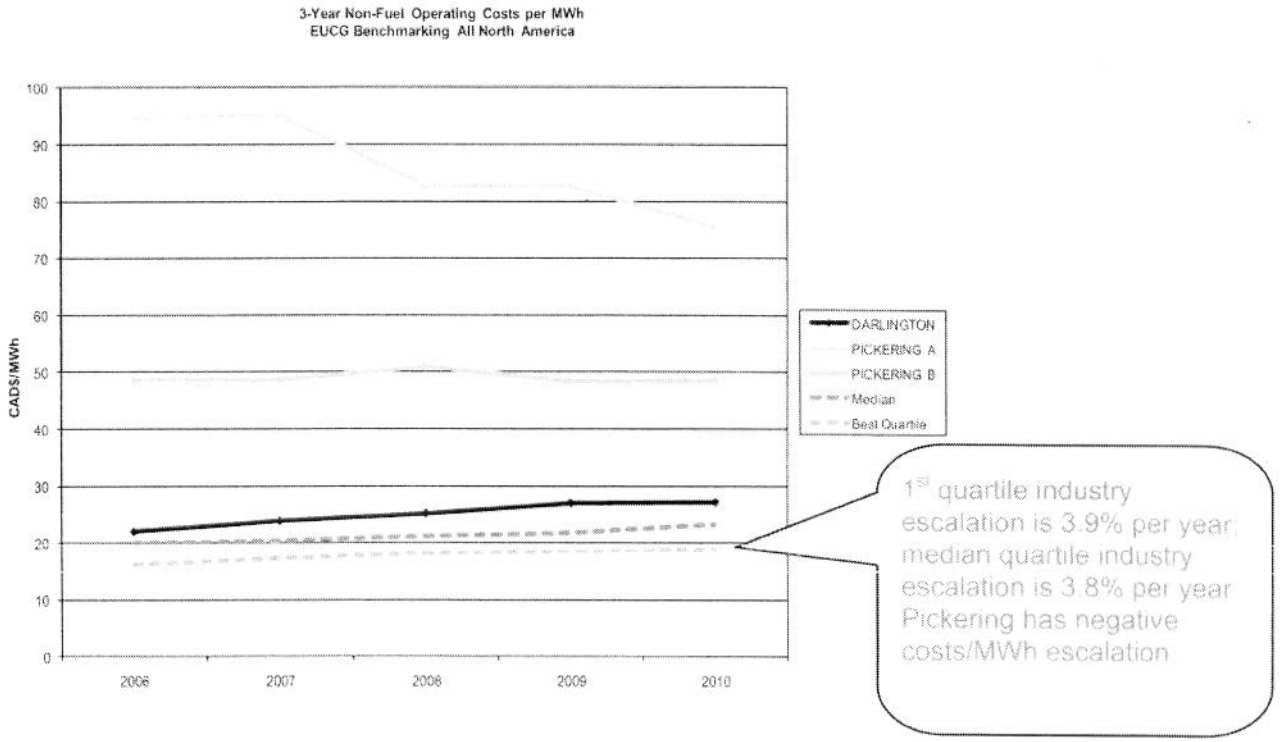
Trends in Non-Fuel Operating Costs

- Both best quartile and median levels increased over the review period with annual percentages increases between 7% and 2%.
- Pickering A non-fuel operating costs per MWh showed a dramatic decrease since 2006 – a significant improvement mostly as a result of improved electricity production.
- Pickering B non-fuel operating costs per MWh stayed relatively close to 2006 levels. Electricity production has improved steadily since 2006 while operating costs increased only moderately.
- Darlington non-fuel operating costs per MWh trended upward at a rate of increase higher than that of the industry as a whole thus lowering its overall performance for this metric. The increase is mostly in base and outage OM&A costs partly offset by lower corporate allocations.

Figure 5 - Trends in Non-Fuel Operating Costs per MWh



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Factors Contributing to NFC Performance

- Financial performance was below median at all three OPG facilities with respect to non-fuel operating cost per MWh. Overall, the biggest drivers are capability factor, station size, CANDU technology, corporate cost allocation and potential controllable costs, all of which are further explained below:
    - The 'capability factor' driver is related specifically to generation performance of the station in relation to the overall potential for the station (results are discussed within the Reliability section within the Rolling Average Unit Capability Factor metric).
    - The 'station size' driver is the combined effect of number and size of units which can have a significant impact on plant cost performance.
    - The 'CANDU technology' driver relates specifically to the concept that CANDU technology results in some specific cost disadvantages related to the overall engineering and maintenance costs in comparison to PWR and BWR plants. In addition, The Nuclear industry CANDU plants have less well-developed user groups to share and adopt operating experience information, than do user groups for PWR and BWR plants. There are currently more PWR and BWR plants compared to CANDU and thus more operating experience to share based on total operating hours. The CANDU technology impact to cost remains the most difficult of all drivers to quantify.
    - The 'corporate cost allocations' driver relates directly to the allocated corporate support costs charged to the nuclear group – and is an area that is focused on by the OPG corporate support groups as part of corporate business planning.
    - The 'potential controllable costs' driver relates to the remaining costs which are not attributable to other specific cost drivers – and is an area that Nuclear is focused on in its business planning to target areas for improvement.
    - Recognition should be given to the challenges a four-unit CANDU site has that is not present with PWR and BWR technology. On-line fuelling, heavy water management and a common vacuum building that connects all units' containment structures raise the complexity of accomplishing scheduled work.

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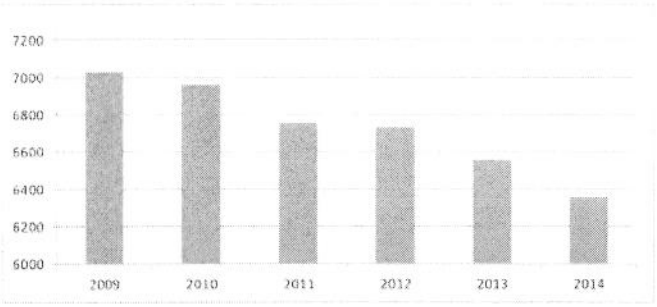
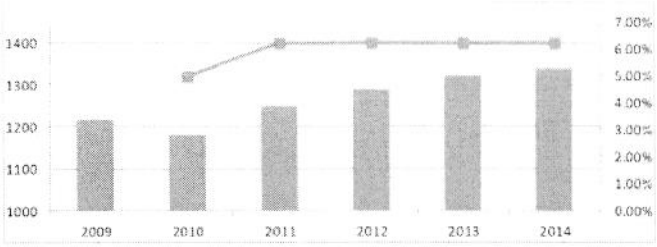
Trend in Nuclear Operations Regular Staff Numbers



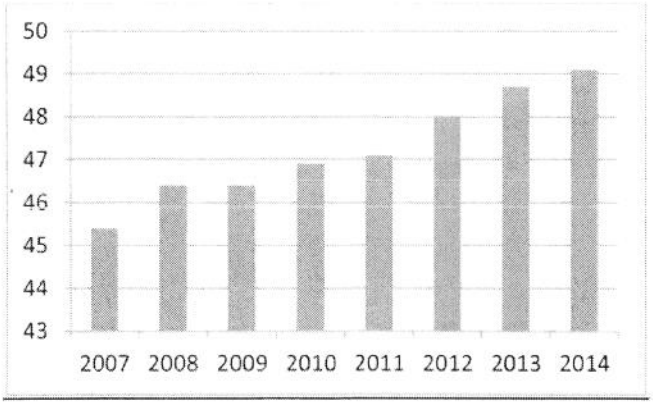
OPG Nuclear Operations regular staff FTEs decrease by 10% over the 2009-2014 period capturing the benefit of expected staff attrition and offsetting pension and OPEB cost increases. Currently OPG Nuclear is 17% above the industry benchmark and by 2014 it will improve to be 6.7% above. With full implementatioin of Business Transformation, Nuclear is targeting to be at median staff benchmark levels.

Base OM&A Costs ($M) Trend



OPG Nuclear base OM&A costs increase by only 2% per year over the 2009-2014 period compared to the industry which has been escalating at levels between 5-6%. This achievement is the result of a continued focus on cost control and work prioritization.

Generation Production Trend



Nuclear production is trending higher over the period 2007-2014 reflecting OPG initiatives to improve plant equipment reliability and reduce forced outages. The improving trend is evident where OPG's forecast nuclear production (3 year rolling average) in 2014 has increased by 8.2% compared to 2007.

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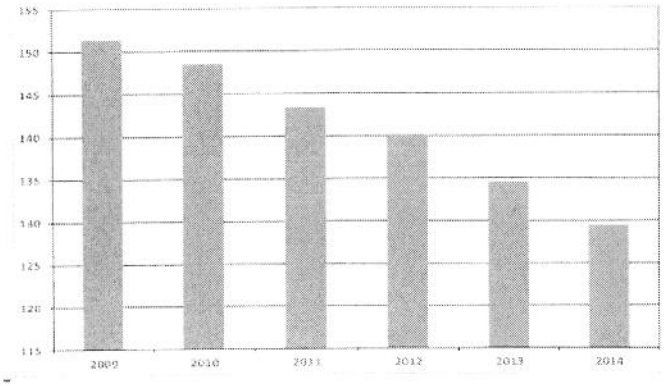
Nuclear Operations Regular Staff per TWh



As Nuclear staff levels reduce and production increases, the Staff/TWh rate is forecasted to reduce 14% by 2014. Since 2008, Staff/TWh has reduced by 5%.