ESSENTIAL SERVICES COMMISSION

Setting a local government efficiency factor

Draft proposal

December 2017

An appropriate citation for this paper is:

Essential Services Commission 2017, *Setting a local government efficiency factor: Draft proposal,* December

Summary

Each year the Minister for Local Government asks us for our advice on the average annual rate cap for the next financial year. We include an efficiency factor in the rate capping formula we use to advise the minister. The purpose of this paper is to seek stakeholder feedback on the commission's proposed approach for setting an efficiency factor.

The draft proposal reflects feedback from the local government sector on our earlier paper — Essential Services Commission 2017*, Measuring productivity in the local government sector: Consultation paper,* September (the consultation paper).

Recapping approaches to set an efficiency factor

In our consultation paper we reviewed four approaches to set the efficiency factor:

- A small, notional factor of 0.05 per cent.
- A proxy value drawn from historic Australian industry productivity data collected and published by the Australian Bureau of Statistics. This approach generated an efficiency factor of 0.17 per cent.
- A value calculated using data envelopment analysis. We identified a range of values from 0.01 to 0.09 per cent
- Using performance data from the local government performance reporting framework to inform the efficiency factor.

We found that efficiency factors generated by the first three approaches were broadly similar and could be considered modest. We found that additional work would need to be done to use the local government performance reporting framework to set the efficiency factor.

Options for setting an efficiency factor

We reviewed each approach against well-recognised regulatory criteria and found that each approach had strengths and weaknesses. This led us to put forward three options in the consultation paper to set the efficiency factor:

- Use the notional value and increase it by 0.05 per cent each year until it reaches 0.2 per cent.[1] The capped amount is consistent with the highest value generated by the three approaches, which was 0.17 per cent. The advantage of this approach is it provides predictability to councils.

---

[1]   Consistent with the approach recorded in Essential Services Commission 2015, *A Blueprint for Change, Local Government Rates Capping & Variation Framework Review — Final Report*, September.

- Use a proxy approach. Under this approach a new efficiency factor would be calculated each year based on ABS data.
- Use a staged approach where we begin by using the notional value and then, when the effects of rate capping are better understood, use the data envelopment approach to estimate a long-term efficiency factor that could be updated periodically (for example, every four years).

Themes from stakeholder feedback on the consultation paper

We received 21 written submissions on the consultation paper and further feedback on the paper from a workshop we held in October. Workshop participants included members of the productivity study working group and staff from councils and peak bodies that provided written submissions on the consultation paper.

Some comments were common across a number of written submissions and from participants at the workshop. These were:

General comments

- Councils generally acknowledged that it is important to operate as efficiently as possible and deliver value to communities.
- The rate capping regime is new. As such it is preferable to wait for its effects to be understood before applying an efficiency factor.
- The consultation paper is very technical and the timelines for consultation are not long enough to give stakeholders an opportunity to understand the issues and respond.

Preferred approach to set the efficiency factor

- The majority of stakeholders preferred not to have an efficiency factor in the rate cap formula.
- There was no support to use the proxy approach to set the efficiency factor.
- There was support from some stakeholders for the unit cost or service level, data envelopment analysis, or notional value approaches to set the efficiency factor. Each of these approaches had strengths and weaknesses that need to be considered if implemented.
- The approach chosen needs to balance simplicity and ease of understanding against complexity and accuracy.

Feedback on other matters

- The productivity trends presented in the consultation paper do not take into account the effects of rate capping.
- There are many differences between councils and therefore a 'one size fits all' model is inappropriate.

- There was mixed feedback from stakeholders about whether councils should be named in the benchmarking example shown in figure 2.2 of the consultation paper.

We note ratepayers were not involved in these discussions and did not make any submissions. Previous correspondence and comments from ratepayer representatives provided strong support for an efficiency factor.

In response, we engaged Predictive Analytics Group to prepare a more accessible version of its original paper on measuring productivity using data envelopment analysis. Predictive Analytics Group also undertook additional analysis to test stakeholder concerns about the robustness of the original models used in the data envelopment analysis. Our draft proposal takes into account stakeholder feedback and the results of Predictive Analytics Group's additional analysis.

Draft proposal

Our draft proposal is to use a staged approach. We begin by using the notional value as the efficiency factor. When the effects of rate capping are better understood, we use the data envelopment analysis approach to estimate a long-term efficiency factor that could be updated periodically (for example every three years). In the first instance the notional value would increase by 0.05 per cent per year and be capped at 0.1 per cent. This result is consistent with the highest value we calculated using data envelopment analysis of 0.09 per cent.

Next steps

We seek stakeholder feedback on our draft proposal for setting an efficiency factor. Following stakeholder feedback on the draft proposal, we intend to release our final proposal by mid-March 2018 on how we will apply an efficiency factor in our annual rate cap advice to the minister.

Contents

1. Introduction

In this chapter, we outline the purpose of this report and how we engaged with the sector on the efficiency factor. We also recap key issues covered in the consultation paper and describe how readers can respond to our draft proposal.

Purpose of this report

The purpose of this paper is to seek stakeholder feedback on the commission's draft proposal for an efficiency factor. The efficiency factor is to be incorporated into our rate cap formula when advising the minister each year.

Stakeholder engagement

We began the process to develop an efficiency factor for inclusion in the rate capping formula in September 2015. In our final report on the local government rates capping and variation framework[2] we said that:

> *The efficiency factor should initially be set at zero in 2016–17 and increase by 0.05 percentage points each year from 2017–18. The Commission will undertake a detailed productivity analysis of the sector to assess the appropriate long–term rate for the efficiency factor.[3]*

To help us identify the appropriate long-term efficiency factor, we established a productivity study working group (the working group) earlier this year. We invited all councils and sector peak bodies to nominate staff to participate on the working group. The main purposes of the working group were to:

- provide relevant data and information
- provide insights and understanding about what is driving productivity trends across the Victorian local government sector
- test preliminary findings of the study
- provide advice on how outcomes are best communicated to the sector.

---

[2] Essential Services Commission 2015*, A blueprint for change, local government rate capping & variation framework review* — final report, September.

[3] The Victorian Government response to the Essential Services Commission's report on the local government rates capping and variation framework review accepted the recommendation to set the efficiency factor at zero for 2016-17 and accepted in principle that it should increase by 0.05 percentage points thereafter, subject to a detailed productivity analysis of the sector by the commission to determine the appropriate long-term rate.

Following the nomination process, the working group comprised representatives from Local Government Victoria, the Municipal Association of Victorian, the Victorian Local Governance Association, the Local Government Professional organization, 15 staff from different councils and members of the commission's local government team.

The working group met with us twice before the release of the consultation paper. It discussed and raised issues about the approaches for measuring productivity, including data envelopment analysis and proxy measures, and broader measures such as the local government performance reporting framework. The working group also discussed the purpose of the efficiency factor and proposed criteria to select between the different available approaches. We released our paper *Setting a local government efficiency factor* (the consultation paper) in September 2017. The consultation paper included input from expert consultants, Predictive Analytics Group and Deloitte Access Economics.

We received 21 written submissions relating to the consultation paper. We reconvened the working group in October 2017. We also invited those who had made submissions to the consultation paper to attend the meeting. At this meeting we gave all participants an opportunity to provide further feedback on the consultation paper and the way forward. Written submissions can be found on our website. A compilation of stakeholder submissions and our responses is attached. All feedback through the consultation process has been considered in making our draft proposal.

We note ratepayers were not involved in these discussions and did not make any submissions. Previous correspondence and comments from ratepayer representatives provided strong support for an efficiency factor.

Productivity study

We used data envelopment analysis to measure productivity levels for the Victorian local government sector over the period 2010-11 to 2015-16. We found that over that period productivity had declined. The data envelopment analysis also provided some data that could be used to set an efficiency factor.[4]

The purpose of an efficiency factor

Incorporating an efficiency factor into pricing formulas is a common way of incentivising service providers to pursue ongoing efficiencies in their operations and pass them on to customers. This can be particularly important in a local government context as services are rarely subject to

---

[4] Readers can refer to the consultation paper and Predictive Analytics Group's attached report for details on data envelopment analysis. Alternatively, Predictive Analytics Group has also prepared a simple version of its report. All reports can be found at: https://www.esc.vic.gov.au/document/local-government/54589-measuring-productivity-local-government-sector/

competitive pressures (as communities cannot seek services elsewhere) and hence can be difficult to benchmark.

Efficiency factors are commonly used in infrastructure pricing decisions (for example, we use an efficiency factor when determining prices for Victorian water businesses). The Independent Pricing and Regulatory Tribunal (IPART) also includes an efficiency factor in its rate peg formula for councils in New South Wales.

How the efficiency factor relates to the rate cap

Under section 185D of the *Local Government Act 1989*, the Minister for Local Government sets the average rate cap based on the change to CPI over the financial year to which the cap applies, plus or minus any adjustments.

Each year since 2016–17, pursuant to section 185D (3)(a) of the Act, the minister must ask the commission for advice on setting the level of the average rate cap.

Consistent with the broad approach developed through the rate capping review, our advice in both years used the formula in box 1.

Box 1   Formula to calculate average rate cap (ARC)
ARC = (0.6 x CPI) + (0.4 x WPI) – efficiency factor

The formula applies a 60 per cent weighting to the rate of increase in the CPI and a 40 per cent weighting to the rate of increase in WPI, less an efficiency factor. We recommended to the minister that the efficiency factor be set at zero for the year 2016–17 and 0.05 per cent for 2017–18.[5]

For both 2016–17 and 2017–18, the minister adopted an average rate cap that was consistent with forecast CPI with no other adjustments.

At this stage, we anticipate that our approach will be to continue to include an efficiency factor which will be informed by feedback from stakeholders on the consultation paper and this draft proposal.

Challenges in measuring productivity and efficiency

We found that measuring productivity and setting an efficiency factor for the local government sector is challenging. Through our analysis we found:

---

5   Our advice can be found on our website (www.esc.vic.gov.au).

- The Australian Bureau of Statistics does not collect productivity data for the local government sector. This means different industry sectors would need to be used, to act as proxy measures of local government productivity change.
- The local government sector is diverse in terms of services delivered and quality of services. This means it is difficult to identify inputs and outputs that would be common to all councils.
- Productivity levels for the Victorian local government sector have not been measured previously.
- It is difficult to account for some inputs. For example, the use of volunteers to deliver services may not be measured.
- Geographic and demographic factors play a role in determining the cost (inputs) of providing services which influence productivity and efficiency.
- There may be a delay between when an input is measured and when the resulting output is recorded. This may be addressed by measuring productivity over a longer period of time to 'smooth' out this effect.
- There may be some influences on efficiency and productivity that are outside a council's control.
- To date we do not have enough data to understand how productivity has been affected by rate capping.

Summary of methods to set an efficiency factor

In the consultation paper we considered four methods to set an annual efficiency factor. We were mindful that the methods considered should use existing data and so minimise the reporting burden on councils. The methods were:

- A small, notional factor of 0.05 per cent.
- A proxy value drawn from historic Australian industry productivity data for other sectors collected and published by the ABS. This resulted in an efficiency factor of 0.17 per cent.[6]
- A value calculated using data from the data envelopment analysis. We identified a range of values from 0.01 to 0.09 per cent.[7]
- Using performance data from the local government performance reporting framework to inform the efficiency factor.

Full details on each approach can be found in the consultation paper and in the consultant's reports that are attached to the consultation paper.[8]

---

[6] Our preferred approach is a five year average of a value added multi factor measure based on the average of 16 Australian industries.

[7] The formula used to calculate an efficiency factor using data from the data envelopment analysis can be found in Appendix A.

Magnitude of the efficiency factor

We found that efficiency factors generated by the first three approaches are broadly similar and could be considered modest. Values ranged between 0.01 and 0.17 per cent. We did not derive an estimate using the local government performance reporting framework because further work would need to be done to do so. We discuss what this further work may entail in chapter 2.

Options for setting an efficiency factor

Our review of each method against well-recognised regulatory criteria suggested that the data envelopment approach best meets the criteria.[9] However, the formula used to calculate the efficiency factor using this approach needs values for the required efficiency gain and the number of years to achieve the gain over. Until the effects of rate capping on productivity and efficiency are better known it would be difficult to make an informed decision about what the values for these parameters should be.[10]

This left us with three options to set the efficiency factor:

- Continue to use the notional value and increase it by 0.05 per cent each year until it reaches 0.2 per cent.[11] The capped amount is consistent with the highest value generated by the three approaches, which was 0.17 per cent. The advantage of this approach is it provides predictability to councils.
- Use the recommended proxy approach. Under this approach a new efficiency factor would be calculated each year based on ABS data.[12]
- Use a staged approach where we begin by using the notional value. When the effects of rate capping are better understood, use the data envelopment analysis approach to estimate a long-term efficiency factor that could be updated periodically.

Structure of this paper

This paper is structured as follows:

Chapter 1 — Introduction

---

8   https://www.esc.vic.gov.au/document/local-government/54589-measuring-productivity-local-government-sector/

9   The regulatory criteria are objectivity, accuracy, applicability, defensibility and cost effectiveness.

10   The values are the required efficiency gain and the number of years over which to achieve the gain. The formula is in Appendix A.

11   Consistent with the approach recorded in Essential Services Commission 2015, *A Blueprint for Change, Local Government Rates Capping & Variation Framework Review — Final Report*, September.

12   IPART used this approach up until 2017-18 when setting a productivity factor to include in the annual rate cap.

Other attachments

Essential Services Commission 2017, *Setting a local government efficiency factor: compilation of stakeholder feedback with our draft responses,* December

Applied Econometrics 2017, *Measuring productivity in the local government sector: a reply to stakeholder comments concerning DEA*, October

Predictive Analytics Group 2017, *Local Government – measuring productivity using a direct method, final report – Summary,* November.

Predictive Analytics Group 2017, *Local government – measuring productivity using a direct method, comparison of alternative models, final,* November

Predictive Analytics Group 2017, *Local government measuring productivity using a direct method a comparison of DEA and Bayesian SFA,* November.

These are available on our website www.esc.vic.gov.au.

Stakeholder feedback

We seek stakeholder feedback on our draft proposal for an efficiency factor.

Responding to this paper

Submissions on this paper close on 14 February 2018.

Please email submissions to localgovernment@esc.vic.gov.au with subject title: 'Submission to Setting an efficiency factor — draft proposal: Victorian Local Government'.

You may also send submissions via mail, marked:

> Attention: Local Government Division
> Essential Services Commission
> Level 37, 2 Lonsdale Street
> Melbourne VIC 3000

Any questions regarding this consultation paper may be directed to:

Merryn Wilson
Project Manager, Local Government Division
03 9032 1300.

Publication of submissions

To promote transparency, we will make all submissions publicly available on our website unless clearly instructed otherwise in the submission.

If your submission contains confidential or commercially sensitive information that you do not wish to be disclosed publicly, please clearly identify the specific information in the submission.

2. Informing our draft proposal

In this chapter we review the feedback that relates directly to setting an efficiency factor. We then draw it together to inform our draft proposal for the efficiency factor.

Themes from stakeholder feedback on the efficiency factor

Some comments were common across a number of written submissions and from participants at the October workshop. These were:

General comments

- Councils generally acknowledged that it is important to operate as efficiently as possible and deliver value to communities.
- The rate capping regime is new. As such it is sensible to wait for its effects to be understood before applying an efficiency factor.
- The consultation paper is very technical and the timelines for consultation are not long enough to give stakeholders an opportunity to understand the issues and respond.

Preferred approach to set the efficiency factor

- The majority of stakeholders preferred not to have efficiency factor in the rate capping formula.
- There was no support to use the proxy method to set the efficiency factor. This was primarily because it was based on industries that were not closely related to local government.
- There was some support for the unit cost or service level, data envelopment analysis, or notional value approaches to set the efficiency factor. Each of these approaches had strengths and weaknesses that need to be considered if implemented.
- The approach chosen needs to balance simplicity and ease of understanding against complexity and accuracy.

In the next sections we provide our responses to the themes. We have included specific comments from councils that clearly illustrate the theme.

Our responses to the general comments on efficiency

Council efficiency

We agree with councils' views that it is important to operate as efficiently as possible and deliver value to ratepayers and communities. As stated earlier, an efficiency factor will help create incentives for councils to do so.

Melton City Council added:

> Penalizing Council's financially through an efficiency factor will restrict their ability to invest in improved technology and systems to improve efficiencies over the long-term. It will also provide a disincentive for Councils to invest in technology and systems in the short to medium term which will benefit Council in the long-term.

The efficiency factor does not limit a councils ability to invest in technology and systems to improve efficiencies. It encourages councils to consider the most cost-effective ways of procuring and using these goods and services. Most importantly it is designed to return efficiencies to ratepayers in keeping with the Fair Go Rates system. Further, the Fair Go Rates system framework does not prevent councils from making savings in excess of the efficiency factor. These additional savings could be another way to fund or partly fund any technology upgrades.

Apply an efficiency factor after the effects of rate capping are known

The City of Boroondara and Melton City Council stated an efficiency factor should not be applied until the effects of the rate capping regime are known.

The City of Boorondara added:

> That the ESC removes reference to any productivity measure until the impact of the rate cap on local government services has been assessed.

Melton City Council said:

> Council is of the view that rate capping has been recently introduced and its effects on the sector are still being assessed and measured. The need to impose an efficiency factor is questionable at this stage.

We agree that at this point in time the effects of rate capping on council productivity and efficiency remain to be seen. This is why for the first year of the rate capping regime (2016-17) we did not include an efficiency factor in our average rate cap advice to the minister. Our consultation paper only proposed modest (small) efficiency factors regardless of the approach chosen to set the factor.

We expect to continue to monitor the effects of rate capping to better understand how council productivity and efficiency are affected. We would then use the results of this analysis to help inform future efficiency factors (beyond this paper) and our annual advice to the minister.

Comparison with the water sector

We have applied efficiency factors in other sectors that we regulate. While comparisons need to be made with caution, under our new water pricing framework, we are seeing water authorities

volunteer efficiency savings of up to almost 3 per cent per year for the next five years. These savings take the form of reductions in operating expenditure (opex). On this basis, a maximum efficiency factor of 0.2 per cent appears very modest. Figure 2.1 below shows the annual efficiency saving (or hurdle) each of the Victorian water authorities has proposed.

Figure 2.1 Victorian water businesses annual efficiency hurdle.
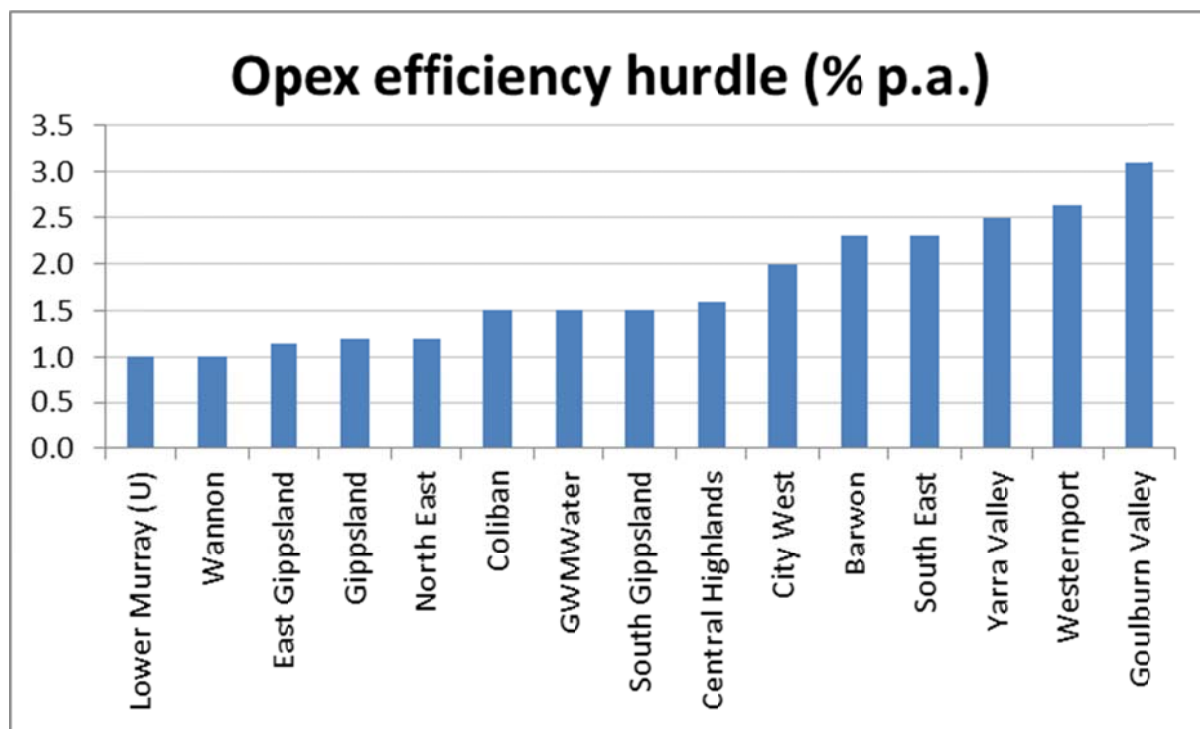
The consultation paper is overly technical and there was a limited time to respond

Some stakeholders said that the consultation paper was very technical and they felt that they didn't have enough time to understand the issues fully before responding.

We agree that the consultation paper is technical – necessarily so as productivity and efficiency are technical topics. In response, we requested Predictive Analytics Group prepare a simpler version of its original report on measuring productivity and setting an efficiency factor using data envelopment analysis. A copy of Predictive Analytics Group's revised report is attached.[13]

To give the sector sufficient time to understand and respond to the issues raised, we have adopted a three stage approach. We will release this draft proposal now and then a final proposal. Given

---

[13] Predictive Analytics Group 2017, *Local Government – Measuring productivity using a direct method, final report – summary,* November. The report can be found at https://www.esc.vic.gov.au/document/local-government/54589-measuring-productivity-local-government-sector/

the paper's release coincides with the Christmas period; we are giving stakeholders two months to respond to the draft proposal and any other matters discussed in the paper.

Our responses to feedback on a preferred approach

There is no need to include an efficiency factor in the rate cap formula

The majority of stakeholders thought it wasn't necessary to include an efficiency factor in the rate cap formula. The main reasons were:

- the rate cap is an efficiency factor
- the minister has adopted a lower average rate cap than the commission's advice for the last two years. This means an efficiency factor has been applied
- cost shifting from other levels of government is another form of an efficiency factor.

The rate cap is an efficiency factor

Several submissions commented that the rate cap was in effect an efficiency factor.

A participant at the October workshop said:

> It is disingenuous to think the efficiency factor is helping us become more efficient. When we have gone from six per cent rate increases to two per cent rate increases, how is 0.05 per cent going to make us more effective?

Our rate cap formula is based on a 60 per cent weighting of CPI and a 40 per cent weighting on WPI to reflect the short term cost pressures faced by councils. On this basis it is reasonable to include an efficiency factor to encourage councils to operate efficiently and share any efficiency gains with ratepayers.

The minister has applied a lower average rate cap

A number of submissions commented that over the past two years the minister has set an average rate cap that was lower than the level of the average rate cap advised by us. This implicitly means an efficiency factor has been included in the average rate cap.

Wodonga City Council added:

> Can be set as low as zero if required, such as when the Minister has declared a lower than recommended rate in the preceding year/s (that has the practical effect of an efficiency factor).

Under the *Local Government Act 1989*, the minister has the power to set an annual rate cap. The minister is not obliged to act on our advice on the rate cap. However, for the reasons outlined in this paper we anticipate that we will always include an efficiency factor in our advice. We also

consider that the advice we provide on each rate cap is independent of the previous year's rate cap. In other words, our advice is standalone. This approach increases transparency and reduces complexity.

Cost shifting

A number of submissions commented that cost (service delivery) shifting from other levels of government without sufficient offsetting revenue was another form of efficiency factor. We found that none of the submissions quantified the effects of cost shifting. This makes it difficult for us to comment further on this matter.

Using a proxy value to set the efficiency factor

Our review of the feedback on the consultation paper showed that there was no support to base the efficiency factor on the proxy measure approach. The primary reason for this was that the proxy was based on industries that carried out activities that were not sufficiently closely related to local government.

The City of Whittlesea's response is similar to a number of other submissions on this matter. They said:

> City of Whittlesea considers this approach not suitable to set the efficiency factor, irrespective of whether three (as per Deloitte's recommendation) or sixteen industries (as per the ESC's proposal) are used to calculate the factor. It is problematic to use a market sector benchmark, since local government is subject to a different set of drivers for organisational performance compared to the market sector. These include political and local considerations as well as community benefit. Local government's role includes intervention to address failures and adverse outcomes of competitive service delivery. The sector would thus provide service activities considered unprofitable in a market environment, which in turn has an adverse effect on the sector's productivity.

We consider that points made in the submissions about using a proxy value based on 16 Australian industries are valid. If in future we decide to use a proxy value for the efficiency factor we would undertake further analysis and consultation with the sector to ensure the proxy as best as possible reflects the activities and performance drivers of local government.

Using the local government performance reporting framework, service level data, data envelopment analysis and the notional value to set an efficiency factor

There was some support for an efficiency factor based on the local government performance reporting framework and service levels, results from the data envelopment analysis or the notional value. The submissions highlighted strengths and weaknesses of each approach.

Corangamite Shire Council and the Municipal Association of Victoria favoured the development of an efficiency factor based on service levels. Service level measures are based on the changes in costs to deliver a particular service or activity.

Corangamite Shire Council added:

> Local councils in comparison may deliver over 100 different services to residents, businesses and visitors. In this regard, the measurement of efficiency is best applied at service or activity level rather than at an aggregated level. This is not dissimilar to the model used within the Victorian public health system.

We agree that efficiency could be measured at a service or activity level. These measures are important in understanding how well councils are delivering individual services. However, looking at efficiency at the individual service levels tells us nothing about a council's overall level of efficiency. Given that the efficiency factor is applied to the rate cap formula it needs to reflect overall efficiency. We acknowledge that for some services, an overall efficiency factor will overestimate what can be achieved. Elsewhere it will underestimate opportunities for more efficient service delivery. As rates fund a broad range of council services we consider that an aggregate measure of efficiency is reasonable. This is because an aggregate measure of efficiency is based on a wide range of inputs used to deliver a wide range of outputs.

The Municipal Association of Victoria stated:

> The LGPRF reports on both broad financial and specific service delivery efficiency indicators. The MAV has concerns about the quality of the reporting of some of the service level indicators in the LGPRF but would argue that further development of this approach might have been considered. We would argue that inferences that may be drawn from this approach would be at least as reliable as those from the DEA approach if the quality of reporting on major services were expanded and found to be improved.
>
> If a factor is to be applied we believe that more work needs to be done with respect to making it more reflective of local government service delivery and actual outputs or cost drivers. To this end further consideration of augmentation of the LGPRF and use of VGC-type approach to establishing relative costs for functions should be considered.

We considered using the local government performance reporting framework indicators as a possible approach to set the efficiency factor but found there were a number of drawbacks including:

- Data has only been collected for two years. This limits the ability to gain an understanding of productivity change over time.

- Most indicators are based on the direct cost of delivering the service not the total cost. Direct cost includes operating costs only. Whereas total costs include costs such as corporate overheads.

- The framework does not collect data on all of the services provided by councils. A core set of services that apply to each council or councils within a group would need to be identified and agreed upon for the purposes of estimating an efficiency factor. These are likely to be broader than the set of services currently reported and this would take time.

- An overall measure of efficiency would need to calculated, likely based on a composite index of services. If an index were made of different services, weights for each service would need to be agreed. This adds another layer of complexity.

- Differences in the quality of services delivered by different councils would need to be addressed. This concern also applies if we used a measure based on Victoria Grants Commission data.

Having said this, as the local government performance reporting framework matures, and after further work with Local Government Victoria, the framework may be able to be expanded and be useful in measuring productivity for the purposes of setting an efficiency factor.

Data envelopment analysis approach

Hume City Council favoured the use of the data envelopment analysis approach to calculate the efficiency factor. Stonnington City Council also preferred the data envelopment analysis approach on the provision that further work is done to address the diversity of the sector.

Hume City Council gave its preferred model specification along with reasons for the efficiency gain and the timeframe to achieve the gain.[14]

Hume City Council added:

> In keeping in mind the intended aim of the efficiency factor - to create incentives for councils to operate more efficiently and ensure that efficiency gains are shared with ratepayers in the form of lower rates — Council strongly urges the use of actual data. The Commission's consultant, Predictive Analytics Group utilised the Victorian Grants Commission response questionnaires provided by all 79 Victorian councils for the period of 2010/11 to 2015/16 as the primary data source. Further, Council believes that the use of actual data (VGC returns) will most likely create the environment for councils to consider efficiencies in the level of inputs used in delivering its services.

---

[14] The formula for calculating an efficiency factor using results from the data envelopment analysis is in Appendix A.

We agree with Hume City Council's observations that using data that directly relates to councils will create an environment for councils to consider the level of inputs used in delivering services. This is one of the strengths of the data envelopment analysis. The Victoria Grants Commission data is more likely to account for the total cost of delivering the outputs. This is rather than just being based on the direct costs as is the case underpinning many of the local government performance reporting framework indicators.

A number of submissions criticised the use of the data envelopment analysis as a way to set the efficiency factor. A sample of comments that cover the key issues follows.

The City of Whittlesea said:

> We consider this approach methodologically appropriate but unsuitable for implementation in the sector. It is too complicated to communicate internally and would introduce unnecessary uncertainty into strategic resource planning. Given the results of the method can be implemented as effectively at lower cost over the long-term using the notional method, this method should only be used for long-term monitoring at State level.

Corangamite Shire Council, the Municipal Association of Victoria, the City of Casey and the City of Wyndham made strong specific criticisms particularly about the robustness of the model specifications used in the data envelopment analysis.

Corangamite Shire Council said:

> The consultation paper identifies four models with different inputs and outputs. The paper indicated that the models use households, businesses and length of roads as proxies for the bundle of services delivered by councils. It is submitted that these are poor proxies for the bundle of services. The inputs and outputs used in the models are overly simplistic.

The Municipal Association of Victoria made a wide range of comments about the validity of the inputs and outputs used in the data envelopment analysis. The City of Casey raised concerns that the data envelopment analysis did not take into account the quality of outputs delivered nor did it take into account the effects of different demographics on the efficiency ratios. The City of Wyndham included an independent review by an academic that raised concerns with the data envelopment analysis approach.

In response to this feedback, we commissioned two pieces of work. We engaged an expert consultant to respond to some stakeholder concerns. We also requested Predictive Analytics

Group undertake additional modelling to address stakeholder concerns about the robustness of the data envelopment analysis. All reports are attached to this paper.[15]

Summary of alternative data envelopment analysis modelling

Predictive Analytics Group undertook additional modelling to test the robustness of the original models used to calculate technical efficiencies and productivity trends for the local government sector.[16] The alternate modelling included:

1. changing the inputs used
2. incorporating community satisfaction scores into the models to act as a proxy for service quality
3. changing the outputs so they directly reflect services delivered
4. changing the outputs to include population
5. using an alternate framework (Bayesian stochastic frontier analysis) to measure local government efficiencies.

1. Revising inputs used

Predictive Analytics Group prepared five alternate model specifications. This was to test whether changing the inputs used in the data envelopment analysis changed the efficiency ratios significantly from the ratios generated under the original models. The changes included:

- Capital expenditure was removed from all models. This was to address stakeholder concerns about the potential for large variations in capital expenditure from year to year and the resulting effects on productivity.

- Depreciation was removed from all models. This was in line with the advice we received from our expert consultant that depreciation may be reported inconsistently across councils.

- The inputs in model one were changed from *staff costs plus capital expenditure costs* **to** *staff costs plus operating expenditure (excluding depreciation costs and staff costs)*. This was so the model accounted for labour that was directly employed by the council and labour that was outsourced.

See Appendix A for a description of the original and alternate models.

---

[15] Applied Econometrics 2017, *Measuring productivity in the local government sector: A reply to stakeholder comments concerning DEA*, October, and Predictive Analytics Group 2017, *Local government – measuring productivity using a direct method, comparison of alternative models, final,* November and Predictive Analytics Group 2017, *Local government measuring productivity using a direct method a comparison of DEA and Bayesian SFA,* November. The reports can be found at https://www.esc.vic.gov.au/document/local-government/54589-measuring-productivity-local-government-sector/

[16] Full technical efficiency occurs at the point (frontier) at which the highest output occurs given specified inputs or the point at which the lowest amount of inputs are used to produce a specified quantity of output. Technical efficiency ratios measure the distance an entity is from the frontier. Full technical efficiency is represented by a score of 1.0.

Predictive Analytics Group found that there were no material differences between the technical efficiency ratios generated under the original model specifications and the alternate model specifications.[17]

Therefore, we can conclude that the original models adequately account for the inputs used by local government.

2. Including community satisfaction scores

Predictive Analytics Group used the alternate specification for model 1 described above (under bullet point 3) and added an additional output — community satisfaction.[18] This was done to address stakeholder concerns that the original models did not take into account the quality of services delivered. Community satisfaction acted as a proxy for quality and was based on the data from the local government community satisfaction survey. Predictive Analytics Group compared the technical efficiency ratio of this model with the ratios generated by the original models.

Predictive Analytics Group added:

> Overall, only minimal differences were found between the models that did and did not include community satisfaction as an output. This finding is consistent with existing academic literature.

Therefore, we can conclude that the original model specifications largely account for the quality of services delivered.

3. Service level data envelopment analysis

Predictive Analytics Group developed three models where service level data was used for the outputs. This was done to compare the results from the original models (where proxies were used to reflect the bundle of services delivered) against results from alternate models where outputs were based on service level data. The models used:

- Operating expenditure as an input and total length of road and total tonnes of garbage collected as outputs.
- Operating expenditure as the input and a number of services including planning application processing, library loans, animal management requests and food complaints were used as outputs. The output data was sourced from the local government performance reporting framework.

---

[17] The variance between the results from original models and the alternate models was negligible and within the range of approximately +/- 10 per cent.

[18] The model specification is Inputs: staff costs plus operating expenditure (excluding depreciation and staff costs). Outputs: households (number) plus businesses (number) plus roads (km) plus council group's overall satisfaction score.

- Waste related expenditure, population density and waste cost disposal index data were used as inputs and total garbage and recyclables collected and the implied recycling rate were used as outputs.

The first two models generated lower technical efficiency ratios than the original or alternate models using single group analysis. This was particularly the case for the model using local government performance reporting framework data. However, the scores generated using multiple group analysis for both models were largely consistent with the results generated by the original models using multiple group analysis.[19]

The technical efficiency scores generated by the waste management data envelopment analysis were consistent with the original models.

This means that using outputs based on proxies (to reflect a bundle of services delivered) generates results that are similar to models that use service level data as outputs. This is particularly the case when multiple group analysis is used. Therefore, we can conclude that the original models adequately account for the outputs delivered by local government.

4. Including population as an output

Predictive Analytics Group updated one of its models by removing number of households and replacing this with population.[20] The technical efficiency ratios generated by the population model were consistent with the original model described. This means including population as an output generates similar results to those models that include number of households as an output.

Therefore we can conclude that using the number of households as an output (as in the original models) adequately reflects the number of residents that use council services.

5. An alternate framework – Bayesian stochastic frontier analysis

Predictive Analytics Group used an alternative modelling framework called Bayesian stochastic frontier analysis to measure local government efficiencies. While the literature showed data envelopment analysis is the most common way of measuring local government efficiencies, Bayesian stochastic frontier analysis has also been used. Predictive Analytics Group found that the results from the Bayesian stochastic frontier analysis were not statistically different from those calculated using data envelopment analysis.

---

[19] Single group analysis compares a council against the remaining 78 councils. Multiple group analysis compares councils with other councils within their council group. Multiple group analysis accounts for some differences between groups, hence efficiency scores tend to be higher than those calculated using single group analysis.

[20] Inputs: staff costs plus operating expenses (excluding depreciation and staff costs). Outputs: businesses plus roads plus population.

Predictive Analytics Group also found that the results of the Bayesian analysis were statistically unreliable.

Conclusion — data envelopment analysis

Predictive Analytics Group's additional analysis showed that altering the inputs and outputs used in the data envelopment analysis does not change the technical efficiency ratios significantly. This was particularly the case when multiple group analysis was used. Predictive Analytics Group explained that results are similar at the aggregated and disaggregated level because both data sets have a common driver – changes in population. Furthermore, the results from the alternate framework developed by Predictive Analytics Group (Bayesian stochastic frontier analysis) were not statistically different from the results from the original and alternate models used in the data envelopment analysis.

This indicates that the original models put forward in the consultation paper are reasonably robust and fit for our purposes. That is, these models can be relied upon to generate information that is used in the efficiency factor calculation. The information can also be used to monitor council or council group efficiency at a high level as part of our outcomes reporting.[21]

Furthermore, the efficiency factor generated using information from data envelopment analysis gives a more accurate estimation of the reduction in inputs required to generate a specified increase in efficiency over a given timeframe. This is because the analysis is based on input and output data directly related to the sector.

Finally, on a practical level, the analysis uses data that is readily available and does not place additional reporting burdens on councils.

However, we recognise that more work can be done to:

- understand whether different inputs and particularly outputs can be used to better reflect council operations.
- explore whether the effects of different demographics can be measured.
- understand how productivity and efficiency are affected by rate capping.
- develop case studies to support and understand the results from the data envelopment analysis.

Notional value approach

A number of councils supported the use of the notional value approach. The primary reasons were it is simple to understand and is inexpensive to implement. Some councils did not support the use

---

[21] We intend to report on the outcomes of the Fair Go Rates system every two years.

of a notional value because it was arbitrary in nature and did not directly relate to local government efficiency or productivity.

Our view is the notional value is simple to understand and acts as a modest efficiency factor. Its weakness is that it does not derive directly from an analysis of local government activities.

Balancing simplicity against accuracy

A number of submissions commented on the importance of balancing the simplicity and predictability of the approach against the benefits of adopting a more complex and accurate approach. We have taken these factors into account in our draft proposal.

Draft proposal

We will continue to include an efficiency factor in our rate capping advice to the minister. Incorporating an efficiency factor into pricing formulas is a common way of incentivising service providers to pursue efficiencies in their operations and pass them on to customers. We see that in this regard local government is no different from the other sectors we regulate and as such an efficiency factor should apply. This can be particularly important in a local government context as services are rarely subject to competitive pressures as communities cannot seek services elsewhere.

We have based the productivity study on the best data available and used well-established methods to calculate an efficiency factor. However, we recognise that there are some limitations at the moment. For example, the effects of the rate capping regime on productivity and efficiency are not yet fully revealed. This limits the use of the data envelopment approach which relies on judgements about the efficiency gains to be achieved and the timeframe over which the gains are achieved.

Nevertheless, we consider that over time as the effects of rate capping become known, data envelopment analysis is capable of calculating a robust efficiency factor. This is because the efficiency factor (calculated using the data envelopment approach) will directly reflect the reduction in inputs (in percentage terms) needed to achieve required efficiency gains over a specified period of time.

Expanding the local government performance reporting framework could also be a longer term option to help inform the efficiency factor. A significant amount of work would need to be done with the sector and Local Government Victoria to make it useful for this purpose.

Consistent with stakeholder comments, we recognise that the notional approach does not directly reflect productivity levels of the sector, but it is easy to understand and communicate and is cost effective to implement.

On this basis we are proposing an approach that will give the sector some certainty about our advice to the minister.

Our draft proposal is to use a staged approach. We begin by using the notional value as the efficiency factor. When the effects of rate capping are better understood, we use the data envelopment approach to estimate a long-term efficiency factor that could be updated periodically (for example every 3 years). In the first instance the notional value would increase by 0.05 per cent per year and be capped at 0.1 per cent. This result is consistent with the highest value we calculated previously using the data envelopment analysis approach of 0.09 per cent.

Table 2.1 below shows how our draft proposal will work in practice.

Table 2.1 Efficiency factors by year.

Year	2015-16[a]	2016-17[a]	2017-18[a]	2018-19	2019-20	2020-21
Efficiency factor (%)	0.00	0.05	0.10	0.10	0.10	To be reviewed.

a Proposed by us in our advice to the Minister.

3. Other feedback and next steps

Along with feedback on the preferred efficiency factor, we sought feedback on other matters discussed in the consultation paper. This included productivity trends and benchmarking. In this chapter we outline our response to this feedback and discuss next steps.

Themes from stakeholder feedback

Some comments were common across a number of written submissions and from participants at the October workshop. These were:

- The productivity trends presented in the consultation paper do not take into account the effects of rate capping.
- There are many differences between councils and a 'one size fits all' approach is inappropriate.
- There were opposing views about whether councils should be named in the benchmarking example shown in figure 2.2 of the consultation paper.

Productivity trends

Some submissions said that the productivity trends (for the sector) presented in the consultation paper did not reflect the effects of rate capping. And therefore, the trends could not be used to draw conclusions about the sector's efficiency.

We based our analysis on the best available data. The last year of available data was for 2015-16 – the year before rate capping began. We intend to continue to monitor productivity across the sector as a part of our outcomes reporting. Accordingly, any future analysis will include data from years covered by rate capping.

There are many differences between councils

Several submissions noted that there are many differences between councils. Some of the differences between councils relate to population, services delivered, area covered, geographic features, maturity of information technology employed, funding mix and financial situation. And as a result of these differences, a 'one size fits all' model to measure productivity and efficiency is inappropriate. We agree that there are significant differences between some councils and council groups. In our consultation paper we measured technical efficiency scores in two ways. Single group analysis compares all 79 councils against each other. Multiple group analysis compares councils against other councils within their group. This helps to account for some of the differences between council groups. In future when we set the efficiency factor (using data envelopment analysis) we would consider using multiple group analysis. It is important to note that one efficiency factor for the sector can be calculated using multiple group analysis.

On a related matter, some councils commented that because councils are diverse, different efficiency factors should apply to different council groups. Our view is a uniform efficiency factor should apply. This is because the proposed efficiency factor is modest.[22] Further, the rate cap variation process is in place to deal with situations where councils consider that the rate cap is insufficient.

Some councils also argued that if a council was fully efficient, as measured in the benchmarking exercise (described below) then an efficiency factor should not apply. Our view is the benchmarking exercise measured each council's efficiency relative to its peers. Therefore, although a council is relatively efficient this does not mean it cannot become more efficient over time.

Naming councils in the consultation paper

In our consultation paper we presented the results of a benchmarking exercise that compared the technical efficiency of all 79 councils using data envelopment analysis. Councils were de-identified in this exercise (refer to figure 2.2 in the consultation paper). We used this exercise to give stakeholders an example of how benchmarking could be done across the local government sector.

We received opposing views from stakeholders at the October workshop about whether councils should be named.

We consider this was only intended as an example of how benchmarking could be done. We have not decided whether this will be the only way that we would benchmark councils. In future, we may use a range of different model specifications in the data envelopment analysis and/or benchmark performance over different years.

If councils wish to see how they performed in this benchmarking exercise they can contact us for a confidential discussion. Requests should be made before 31 January 2018.

Next steps

Following stakeholder feedback on the draft proposal, we intend to release our final proposal by mid–March 2018 on how we will apply an efficiency factor in our annual rate cap advice to the minister.

---

[22] Refer to Chapter 2 — comparison with the water sector.

Appendix A

Table A.1 Original model specifications for data envelopment analysis

Model	Inputs	Outputs
Model 1	Staff ($) + Capital ($)	H/holds + Businesses + Roads
Model 2	Staff (FTE) + Capital ($)	H/holds + Businesses + Roads
Model 3	Staff ($) + Capital ($)	H/holds + Businesses + Roads + Waste (Tonnes)
Model 4	Capital ($) + Operating Expenses (excluding Depreciation) ($)	H/holds + Businesses + Roads
Model 5	Operating Expenses (excluding Depreciation) ($) + Depreciation ($)	H/holds + Businesses + Roads

Table A.2 Alternate models for data envelopment analysis

Model	Inputs	Outputs
Model 1 Revised	Staff ($) + Operating Expenses (excluding Depreciation and Staff) ($)	H/holds + Businesses + Roads
Model 2 Revised	Staff (FTE)	H/holds + Businesses + Roads
Model 3 Revised	Staff ($)	H/holds + Businesses + Roads + Waste (Tonnes)
Model 4 Revised	Operating Expenses (excluding Depreciation) ($)	H/holds + Businesses + Roads
Model 5 Revised	Operating Expenses (excluding Depreciation) ($)	H/holds + Businesses + Roads

Box A.1   calculating the efficiency factor using the outputs from data envelopment analysis

Efficiency factor = TFPC + $((1+p\,(1-TE))^{1/t} -1)$ x100

Where TFPC = Total Factor Productivity Change

TE = Technical Efficiency score

p = the required efficiency gain in percentage terms

t = the time (in years) that the efficiency gain is required