# Final determinations

# and

# Explanatory statement

F-factor scheme determinations 2012–15

for

Victorian electricity distribution network service providers

22 December 2011

# Contents

# Shortened forms

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|---|---|
| AER | Australian Energy Regulator |
| CFA | Country Fire Authority |
| DNSP | Electricity Distribution Network Service Provider |
| DSE | Department of Sustainability and Environment |
| ESV | Energy Safe Victoria |
| MFB | Metropolitan Fire and Emergency Services Board |
| NER | National Electricity Rules |
| NEL | National Electricity Law |

# Structure of this paper

This paper is structured as follows:

- Chapter 1 provides the background information about the f-factor scheme.

- Chapter 2 outlines the considerations and reasons of the AER's draft determination.

- Chapter 3 provides a summary of the submissions to the AER.

- Chapter 4 outlines the AER's consideration of the submissions.

- Chapter 5 provides the AER's final determinations for each DNSP.

# 1 Introduction

On 24 June 2010, the Victorian Parliament passed the *Energy and Resources Legislation Amendment Act 2010*. The Act amended the *National Electricity (Victoria) Act 2005* (the NEVA) to introduce an 'f-factor scheme'. This scheme is intended for providing incentives for Distribution Network Service Providers (DNSPs) to reduce the risk of fire starts and to reduce the risk of loss or damage caused by fire starts.[1]

Under section 16C of NEVA, the Victorian Governor in Council, by Order published in the Government Gazette, may confer functions and powers, or impose duties, on the Australian Energy Regulator (AER) to make a determination for the purpose of providing incentives for DNSPs to reduce the risk of fire starts and reduce the risk of loss or damage caused by fire starts.

Subsequent to passing the *Energy and Resources Legislation Amendment Act 2010*, the Victorian Government published an *f-factor scheme order 2011* (the Order) on 23 June 2011.

The Order requires that the AER must make, no later than 31 December 2011, an f-factor scheme determination for each of the DNSPs to take effect in the first distribution determination period (2011–15). The targets should be based on the average historical fire starts of the DNSPs over the five previous calendar years—that is the average of 2006–10.

On 5 October 2011 the AER made its f-factor scheme draft decision. The AER sought comments form the Victorian DNSPs, the Hon. Michael O'Brien, Minister for Energy and Resources, the Country Fire Authority (CFA), Metropolitan Fire and Emergency Services Board (MFB), the Department of Sustainability and Environment (DSE), Energy Safe Victoria (ESV) and the general public. In accordance with the Order, the AER provided not less than six weeks of consultation. Submissions were received from Jemena, CitiPower and Powercor, United Energy, the CFA and DSE.

This paper sets out the AER's final decision and the f-factor scheme determination for the first distribution determination period and explanatory statement for the purpose of clause 14 of the Order for the f-factor scheme determinations. It presents the AER's:

▪ process in making this f-factor scheme determination

▪ considerations and reasons for making this determination

▪ f-factor scheme determination for each of the five Victorian DNSPs.

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[1] Energy and Resources Legislation Amendment Bill 2010, *Explanatory Memorandum*, p.10.

## 1.1 The f-factor scheme

The f-factor scheme is intended to provide a financial incentive for DNSPs to reduce the number of fire starts in their distribution networks. For the first four years (2012–15), DNSPs will be either rewarded or penalised at the incentive rate of $25,000 per fire for performing better or worse than their respective fire start targets.

After the first period, the AER may vary the incentive rates and mechanism of the scheme, such as applying different targets for different parts of the network.

The following sections explain how the financial rewards and penalties arising from the f-factor scheme will be applied.

### 1.1.1 Revenue adjustment mechanism under the f-factor scheme

Clause 7(2) of the Order specifies that, based on the actual fire starts in comparison with the target number of fire starts each year (t-2), the f-factor scheme shall result in adjustments to DNSPs' revenue for year (t)—that is two years later. The AER notes the revenue adjustment will start from 2014 based on the actual outcome of 2012. The adjustment will be in the form of:

$$Revenue\ adjustment_{t,n} = \sum_{m=1}^{q} Incentive\ rate_{t-2,n,m} \times (Target\ no.\ of\ fires_{t-2,n,m} - Number\ of\ fires_{t-2,n,m})$$

where the distribution system is made up of $q$ parts and–

(a) *Revenue adjustment$_{t,n}$* is the adjustment to the revenue for Distribution Network Service Provider $n$ for regulatory year $t$;

(b) *Incentive rate$_{t-2,n,m}$* is the incentive rate for part $m$ of distribution system $n$ for regulatory year $t-2$, determined in accordance with clause 10 or 11 as the case may be;

(c) *Target no. of fires$_{t-2,n,m}$* is the fire start target for regulatory year $t-2$ for part $m$ of distribution system $n$, determined in accordance with clause 8; and

(d) *Number of fires$_{t-2,n,m}$* is the number of fire starts in relation to part $m$ of distribution system $n$ that occurred in regulatory year $t–2$, determined in accordance with clause 9.

Clause 7(4) of the Order specifies that, for the purposes of a distribution determination, a revenue adjustment under an f-factor scheme is not revenue of, expenditure by or a cost of a Distribution Network Service Provider unless the AER determines otherwise.

### 1.1.2 Parameters of revenue adjustment rates

In accordance with clause 12(2) of the Order, the AER must make an f-factor amount determination with respect to amounts to be passed through in the regulatory years that commence 1 January 2014 and 1 January 2015.

Under clause 13(1), the amount specified in an f-factor determination is to be treated as a positive pass through or a negative pass through amount for the purposes of the NER.

Under clause 13(2), the AER will issue an f-factor amount determination as determined as follows:

$$Pass\ through\ amount_{t,n} = Incentive\ rate_{t-2} \times (Target\ no.\ of\ fires_{t-2,n} - Number\ of\ fires_{t-2,n})$$

where -

(a) **Pass through amount$_{t,n}$** is the amount for Distribution Network Service Provider $n$ for regulatory year $t$ which may (but does not have to) be expressed as a percentage adjustment to the revenue of the Distribution Network Service Provider;

(b) **Incentive rate$_{t-2}$** is $25,000;

(c) **Target no. of fires$_{t-2,n}$** is the fire start benchmark for regulatory year $t-2$ for distribution system $n$, determined in accordance with clause 8; and

(d) **Number of fires$_{t-2,n}$** is the number of fire starts in relation to distribution system n that occurred in regulatory year $t-2$, determined in accordance with clause 9.

### 1.1.3 What are fire starts?

Under clause 4 of the Order, fire starts covered by an f-factor scheme determination are any fire:

(a) that starts in or originates from a distribution system;

(b) started by any tree, or part of a tree, falling upon or coming into contact with a distribution system;

(c) started by any person, bird, reptile or other animal in or on a distribution system;

(d) started by lightning striking a distribution system or a part of a distribution system; and

(e) started by any other thing forming part of or coming into contact with a distribution system; or

(f) otherwise started by a distribution system.

## 1.2 Legislative requirements in making this determination

The Order requires that,[2] the AER must:

- publish its proposal for the f-factor scheme determination;

- publish an explanatory statement that sets out the provisions under or for the purpose of which the f-factor scheme determination is required and the reasons for the determination;

- consult with the relevant parties; and

- follow the distribution consultation procedures set out in rule 6.16 of the National Electricity Rules (NER), as modified by the Order.

The AER is required under clause 6 of the Order to make an f-factor scheme determination, which outlines that:

> (1) The AER must make an f-factor scheme determination in accordance with this Order.
>
> *Note: Pursuant to section 16E(1)(a) and (b) of the National Electricity (Victoria) Act 2005, the AER must perform or exercise its functions and powers under this Order in a manner that will or is likely to contribute to the achievement of the national electricity objective.*
>
> (2) The AER must make, no later than 31 December 2011, an f-factor scheme determination to take effect in the first distribution determination period.
>
> (3) F-factor scheme determinations that take effect for a regulatory control period subsequent to the first distribution determination period must be made by the AER so as to take effect at the commencement of each such subsequent regulatory control period.
>
> (4) The AER must publish an f-factor scheme determination. An f-factor scheme determination for a regulatory control period subsequent to the first distribution determination period may be published as part of a distribution determination for that regulatory control period.

Clause 7(1) of the Order provides:

> An f-factor scheme determination must establish an f-factor scheme that complies with this Order and under which there is a revenue adjustment for a Distribution Network Service Provider.

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[2] Clause 14 of the Order.

# 2 AER's draft decision

DNSPs provided their respective fire start records, proposed adjustments to allow for previously unreported fire start (due to changes in reporting requirements) and their proposed fire start target numbers to the AER. The AER also sought independent fire start information from Energy Safe Victoria (ESV), Metropolitan Fire and Emergency Services Board (MFB), Country Fire Authority (CFA) and the Department of Sustainability and Environment (DSE).

To inform the AER's draft determinations, the AER engaged a technical consultant and compared DNSPs' fire start information to that of other relevant agencies.

## 2.1 Consultant's advice

The AER requested the assistance of technical experts Sinclair Knight Merz (SKM), to assist the AER in assessing the initial claims by the DNSPs regarding estimations of unrecorded historical fire starts.

After attending meetings with all the Victorian DNSPs, the SKM formed the view that:

- All Victorian DNSPs appear to have robust systems to capture reliability data.[3]

- The fire start data is sourced from DNSPs' core business systems.[4]

- Some fires, such as streetlights, are unlikely to cause a fire in surrounding grass or trees, however, they have been correctly reported by DNSPs under the Order's definition as fire starts.[5]

- The DNSPs' data is a balanced and robust view on the number of fire starts associated with each DNSP's network.[6]

- Some improvements to data recording and regular auditing are desirable.[7]

SKM also identified a number of duplicate fire start records in DNSPs' fire start proposals.

## 2.2 Information from ESV, MFB, CFA and DSE

Energy Safe Victoria (ESV), Metropolitan Fire and Emergency Services Board (MFB), Country Fire Authority (CFA), and the Department of Sustainability and Environment (DSE) provided their fire start records to the AER. In making the draft determination, the AER and its consultant used the information to:

- Cross check a sample of DNSPs' fire start claims.

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[3] SKM, *F-Factor Incentive Scheme Final,* 19 September 2011, p.15.
[4] ibid p.16.
[5] ibid p.16.
[6] ibid p.17.
[7] ibid, p.17.

■ Provide a high level aggregate 'reasonableness check' on the DNSPs' fire start claims.

The AER's cross checks did not raise concerns with the robustness of the DNSPs' reporting. In addition, the aggregate number of fire starts submitted by the DNSPs appeared reasonable when compared to the MFB, CFA and DSE data. The AER expected there to be some discrepancy between the two sources.[8]

## 2.3 Overall assessment

Overall, the AER accepted that the fire start information provided by the DNSPs were accurate because:

■ SKM and the AER reviewed the historical fire start data provided by the DNSPs. The queries SKM and the AER had with the DNSPs' respective proposals were addressed by the relevant DNSP to the satisfaction of the AER.

■ SKM found that all Victorian DNSPs appear to have robust systems to capture reliability data and the fire start data is sourced from DNSPs' core business systems.[9] Additionally, the AER did not find any substantial issues regarding the DNSPs' submitted data through the AER's cross checking and analysis. The AER considered any remaining errors and double counting were likely the result of manual transfer of data from one system to another. Once the record system is automated, the error was expected to be small. Hence, the AER accepted SKM's advice.

■ The aggregate number of fire starts appeared reasonable when compared to the MFB, CFA and DSE data.

However, the AER did not consider United Energy's method to estimate unrecorded fire starts accurate. The AER applied an alternative method to calculate the fire start target proposed by United Energy.

## 2.4 AER's draft decision findings of DNSPs' initial fire start information

The AER, with advice from its consultant, assessed the reasonableness of the assumptions and methodologies proposed by the DNSP regarding their fire start information and their estimations of unrecorded fire starts. The AER's findings are summarised in the follow sections.

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[8] AER, *Draft determinations and Explanatory statement for the draft determinations*, 5 October 2011, p. 12, 13, 20.
[9] SKM, *F-Factor Incentive Scheme Final*, 19 September 2011, p.15, 16.

### 2.4.1 CitiPower

After its initial proposal, CitiPower identified one duplicate fire start record, which it removed and then resubmitted the fire start information.[10] The AER, informed by SKM's advice, considered that CitiPower's fire start information was accurate.

### 2.4.2 Jemena

The AER accepted Jemena's proposed estimated fire starts. The AER considered Jemena's method of assuming 80 per cent of non pole fire starts may have been recorded in the past appeared reasonable, given its justifications. SKM also considered Jemena's proposed unrecorded fire starts should be included in developing a fire start target.[11]

The AER and SKM did not identify any duplicate fire start records in Jemena's proposal.

### 2.4.3 Powercor

The AER, informed by SKM's advice, considered Powercor's target accurate, except for ██ duplicate fire start entries in the proposal. The duplicate entries were removed from the fire start target.

### 2.4.4 SP AusNet

After the removal of six duplicate fire start events, the AER considered SP AusNet's fire start target accurate.

### 2.4.5 United Energy

United Energy provided historical fire start records. The AER questioned some records which appeared to be duplicates. United Energy removed duplicates but for one additional duplicate entry identified by the AER, the AER accepted United Energy's fire start records as accurate.

United Energy proposed a method for making an adjustment to its proposed fire start target for the number of unrecorded fires. United Energy's method was to first identify historical network events that could potentially lead to a fire start. Then it used an assumption that percentages of these events would have resulted in a fire start.[12] The impact of United Energy's proposed method was to increase the number of fire starts over five years by ██, which would have the effect of increasing its annual target by ██.

The AER noted that United Energy's proposed method resulted in a significantly (more than 5 times) higher number of unrecorded fire starts when compared to recorded fire starts of a similar category. Therefore, the AER was concerned about the assumptions proposed by United Energy and considered the approach was prone to generate substantive errors.

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[10] Powercor, *Resubmitted RIN*, 12 September 2011.
[11] SKM, *F-Factor Incentive Scheme Final*, 19 September 2011, p. 15.
[12] United Energy did not substantiate the percentages applied.

The AER considered it appropriate to apply Jemena's method to estimate the previously unrecorded fires because the AER understands that until 30 July 2011, Jemena Asset Management was the exclusive provider of services including network planning, construction, management, operation, maintenance and engineering to United Energy. To apply this method the AER excluded pole fires and then escalated the number of other fire starts by 25 per cent.[13] Applying this method resulted in an adjustment of 61 fires, or an increase to United Energy's annual target of 12.2. As the final number of estimated fire starts was about 10 per cent of the total number, the AER was satisfied with the assumption. The AER considered its adjustment would more likely to be closer to the number of unrecorded fire starts than that proposed by United Energy.

## 2.4.6   The AER's draft decision

The AER made the following draft decision:

Table 2.1      **AER draft decision on fire start target for Victorian DNSPs 2012–15, compared with the targets proposed by DNSPs**

| DNSP | Draft Fire Start Target determined by the AER | *Fire Start Target proposed by DNSPs for the draft decision* |
|---|---|---|
| CitiPower | 30.4 | ■ |
| Powercor | 401.8 | ■ |
| Jemena | 56.8 | 56.8 |
| SP AusNet | 256.8 | 258 |
| United Energy | 124.2 | 133.4 |

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[13]   A 25 per cent adjustment is equivalent to assuming 80 per cent of fires were not recorded (1/0.8 = 1.25).

# 3 Submissions to the draft decision

The AER made its draft determinations and explanatory statement on 5 October 2011. In accordance with the Order and the NER, the AER allowed no less than 30 business days for making submissions. The AER sent invitations for written submissions to stakeholders including the Victorian DNSPs, the Minister and other relevant entities.

The AER received five submissions to its draft determinations, from Jemena, CitiPower and Power, United Energy, the CFA and DSE.

## 3.1 CitiPower

CitiPower did not comment on the AER's draft decision.[14]

## 3.2 Jemena

JEN welcomed the AER's draft determination.[15]

## 3.3 Powercor

Powercor did not comment on the AER's draft decision.[16]

## 3.4 United Energy

Based on three consultants' reports—by Energy Transfer Solutions, Rho Environmetrics and John Field Consulting, and Dr Neil Diamond—United Energy submitted that:[17]

- it considered the AER's draft approach to estimating unrecorded fire starts was not appropriate and that the fire start benchmark should be 940 fires which translates into a fire start target of 188 (based on the Dr Neil Diamond report)

- it has found that United Energy's fire start records prior to 2010 were not based on reliable field reports by linesmen, because its linesmen were not fully briefed on the methods for reporting fire starts

- it has identified a new method for estimating unrecorded fire starts and setting the fire start target.

United Energy's consultants' opinions about the AER's draft determination, and United Energy's contentions are summarised below.

The Energy Transfer Solutions (ETS) report considered that because DNSPs' data collection systems are focussed on network reliability, DNSPs' ability to accurately

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[14] CitiPower/Powercor, Re: F-Factor scheme draft determination, 16 November 2011.
[15] JEN, Draft f-factor scheme determinations 2012-15 for Victorian electricity distribution service providers, 5 October 2011.
[16] CitiPower/Powercor, Re: F-Factor scheme draft determination, 16 November 2011.
[17] United Energy, *Previously unrecorded fires that are now covered by the Order*, 18 November 2011 and accompanying documents (received 21 November 2011).

record fire starts is compromised. Thus, ETS considered that the AER's reliance on the fire start data being largely definitive was flawed.[18]

ETS submitted the AER provided no basis for its conclusion in the draft decision that it is reasonable 10 per cent of fire starts were not recorded. The AER did not then apply a 10 per cent estimate to Jemena's fire start data—which discredits the AER's validation. It also invalidates the AER's basis for rejecting SKM's assessment, that United Energy's claim was reasonable.[19]

ETS questioned the AER's observation that the number of unrecorded fires under any category should not be larger than recoded fires. ETS also noted that a 2 per cent variation to United Energy's uplift factors (in the approach initially proposed by United Energy) would result in an additional 28.2 fires—more than the number of fires allocated to United Energy by the AER—thus suggesting the AER's draft determination may be low.[20]

Rho Environmetrics and John Field Consulting's report outlined that given the similarity of United Energy and Jemena, it would seem reasonable to assume similar patterns of fires. However, statistical analysis indicated that there are significant differences in the patterns of the recorded fires for the two DNSPs. The report considered this casts doubt on the AER's assumption that the proportion of unrecorded fires is the same for Jemena and United Energy. The report noted it seems unlikely that the differences in fire start categories between Jemena and United Energy were due to recording errors alone.[21]

United Energy advised that it examined its fire start report and has become aware that there was systematic under reporting of fire starts between 2006 and 2010.[22] It engaged Dr Neil Diamond to undertake a statistical assessment of the likely overall fire start number.

Dr Neil Diamond's report used a maximum likelihood regression to estimate the total number of fire starts, as well as the probability of a fire start being reported, based on a Generalised Poisson distribution model (that is 'equivalent' to a Negative Binomial model) for the analysis of underreported count data.[23] The explanatory variables used were monthly maximum temperature [averages of daily maximum temperature of each month] and the log of total rainfall in the previous month. Dr Diamond's calculation found that the estimated actual fire starts is 940 over the five year period, with a 95 per cent confidence interval of 771 to 1369 fires.

United Energy also sought further clarification on what constitutes a fire start. It submitted that definitions include that three characteristics—heat, light and flames—

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[18] ETS, *Review of the F-factor draft determination as applied to United Energy*, 18 November 2011.
[19] ETS, *Review of the F-factor draft determination as applied to United Energy*, 18 November 2011.
[20] ETS, *Review of the F-factor draft determination as applied to United Energy*, 18 November 2011.
[21] Report by Rho Environmetrics Pty Ltd together with John Field Consulting Pty Ltd, *Examination of an assumption used by the AER in estimating target fire starts for United Energy*, 18 November 2011.
[22] Report for United Energy, *Previously unrecorded fires that are now covered by the Order*, 18 November 2011.
[23] Dr. Neil Diamond, report for United Energy, *Under-reportion of Fire Starts*, 20 November 2011.

must be or have been present. It considered this definition would align with the common use of the word 'fire'.[24]

## 3.5 CFA's submission

CFA in principle supported the concept of an f-factor scheme. CFA was concerned about the extent of redaction in the draft decision because it limits the opportunity for critical review. Additionally, CFA noted the redaction limits the incorporation of the outcomes into CFA's planning and prevention activates. Therefore, CFA welcomed an open exchange of data, under confidential arrangements if necessary.[25]

CFA submitted that challenging f-factor scheme determinations for DNSPs could assist the CFA to keep Victorians safe from fires and emergencies, and protect lives and property. It noted the f-factor scheme should not be seen as an opportunity for financial gain.[26]

## 3.6 DSE's submission

DSE welcomed and supported schemes that encourage electricity distribution network service providers to reduce the risk of fire starts and the risk of loss or damage caused by fires.

DSE advised that it will continue to provide information held corporately to support this initiative and will work with committees such as the Electric Line Clearance Consultative Committee to further reduce the occurrence of fires contributed by electricity distribution networks.[27]

## 3.7 Further material submitted by United Energy

On 2 December 2011, United Energy provided a second report by Rho Environmetrics and John Field Consulting which applied a Capture-Mark-Recapture statistical analysis (the Capture-Mark-Recapture report).[28] In its proposal dated 18 November 2011 (received by the AER on 21 November 2011), United Energy stated that it would provide a Capture-Mark-Recapture report to the AER in the context of supporting Dr. Diamond's report—on which United Energy's proposal of 940 fire starts (which translated into United Energy's proposed fire start target of 188) was based. In its proposal dated 18 November 2011, United Energy stated:

> Dr Diamond reported that the estimate of the number of fire starts which he had obtained, 940, was most likely conservative (in other words, low). This belief has been informed by running trials of other statistical methods, including the Capture-Mark-Recapture method. Dr Diamond has analysed the United Energy data on fire starts, in conjunction with other databases held by

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[24] United Energy, *Previously unrecorded fires that are now covered by the Order*, 18 November 2011.

[25] CFA, *Submission to f-factor scheme draft determination*, 18 November 2011.

[26] CFA, *Submission to f-factor scheme draft determination*, 18 November 2011.

[27] DSE, F-factor scheme determination for Victoria electricity distribution network service providers, 30 November 2011.

[28] Report for United Energy prepared by Rho Environmetrics Pty Ltd together with John Field Consulting Pty Ltd, *Using capture-mark-recapture methods to estimate fire starts in the United Energy distribution area*, 2 December 2011.

the Country Fire Authority (CFA), and the Metropolitan Fire Brigade (MFB). The results from the Capture-Mark-Recapture analysis will be documented and reported separately...

...United Energy submits that the fire factor benchmark to be applied by the AER should be based on the result obtained by Dr Neil Diamond, in other words 940 fires. This translates to an annual f-factor scheme target of 188 fire starts. [29]

On 5 December 2011, United Energy confirmed the purpose of the Capture-Mark-Recapture report. It quoted Dr. Diamond's report dated 20 November 2011 (received by the AER on 21 November 2011):

"Based on my statistical analysis, I believe that the estimate of the number of fire starts which I have obtained, 940, is most likely conservative (in other words, low). This belief has been informed by running trials of other statistical methods, including the Capture-Mark-Recapture method. I have analysed the United Energy data on fire starts, in conjunction with other databases held by the Country Fire Authority (CFA), and the Metropolitan Fire Brigade (MFB)."[30]

Since the Capture-Mark-Recapture report was submitted for the purpose of supporting United Energy's fire start target proposal dated 18 November 2011, the AER considered the Capture-Mark-Recapture report in this context.

## 3.8  Late proposal by United Energy

United Energy submitted a new and late proposal, together with a number of consultants' reports, to the AER on 7 and 8 December 2011. Unlike the material submitted on 2 December 2011, the submissions of 7 and 8 December 2011 contained a new proposal in which United Energy proposed a new fire start target of 1453 fires per year.

This proposed new target is based on an entirely different statistical estimation method to that initially proposed in United Energy's letter dated 18 November 2011.

Clause 14 of the Order provides that the distribution consultation procedures set out in rule 6.16 of the National Electricity Rules (NER) (as amended by clause 14 of the order) are taken to apply and must be followed by the AER when it makes an f-factor scheme determination for the first distribution determination period. Under clause 6.16(c) of the NER, the AER is not required to consider late submissions after the consultation period. The consultation period for the AER's f-factor scheme determination expired on 18 November 2011. The AER has exercised its discretion in this instance and decided not to consider the submissions on 7 and 8 December 2011, including United Energy's new proposal.

United Energy's submissions of 7 and 8 December 2011 contained a new proposal that was based on a new statistical analysis method that had not previously been proposed for setting the fire start target. The AER considers its decision to not

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[29]  United Energy, *Previously unrecorded fires that are now covered by the Order*, 18 November 2011, p.4, 5.
[30]  United Energy, *email (from Jeremy Rothfield)*, 5 December 2011.

consider these new submissions is reasonable because the AER does not have sufficient time to assess United Energy's new proposal or analyse the statistical analysis method on which the proposal was based before the 31 December 2011 deadline as obligated under the Order. This is for the following reasons:

- The AER would need to collect the suitable information relevant to this new method to ensure data accuracy and quality.

- The AER would also need to consult with CFA and MFB to verify the information to be provided by United Energy is indeed the same as what was provided by CFA and MFB to United Energy.

- Given that United Energy's new proposal seeks a target 10 times higher than its original claim (in September 2011) of 133.4 fires per year, the AER would need to review all relevant information, and seek qualified independent experts to verify that United Energy's consultants' methodology and process of analysis are appropriate and accurate, as well as consulting with the *relevant entities* (ESV, DSE, CFA, MFB and the Minister).

- All of the above process would take at least six months, longer if an audit of United Energy's record system is considered necessary to ensure data accuracy.

# 4     AER considerations

This section outlines the AER's considerations and conclusions regarding the benchmark fire start targets for each of the Victorian DNSPs for the 2012–15 period.

## 4.1     Legislative Requirements

Clause 7(1) of the Order provides that an f-factor scheme determination must establish an f-factor scheme that complies with the Order and under which there is a revenue adjustment for a DNSP.

### 4.1.1    Fire Start Target

Clause 8(1) of the Order requires that the AER must determine the fire start target as follows:

$$\textit{Target no. of fires}_{rcp(T),n,m} = \textit{Number of fires}_{n,m} / \textit{Number of years}$$

where -

    (a)   **$\textit{Target no. of fires}_{rcp(T),n,m}$** is the fire start benchmark for part $m$ of distribution system $n$ for regulatory control period $T$;

    (b)   **$\textit{Number of fires}_{n,m}$** is the number of fire starts in relation to part $m$ of distribution system $n$ that occurred in the 5 complete contiguous regulatory years prior to the making of an f-factor scheme determination for regulatory control period $T$, determined in accordance with clause 9; and

    (c)   **$\textit{Number of years}$** is 5.

    (2) In the first distribution determination period, there must be only one fire start target for a distribution system.

## 4.2     AER Considerations

### 4.2.1    CitiPower, Jemena, Powercor and SP AusNet

The AER did not receive additional fire start information since its draft determinations and explanatory statement released on 5 October 2011 for CitiPower, Powercor, Jemena or SP AusNet. Therefore, for the reasons outlined in the AER's draft decision and given no additional information was received, the AER's final decision is to adopt the fire start targets determined in the draft decision for these DNSPs.

### 4.2.2    United Energy

Based on the statistical approach prepared by Dr. Neil Diamond (the statistical approach), United Energy submitted a fire start target of 188—41 per cent higher than its initially proposed fire start target of 133.4.

In calculating the anticipated 'actual' fire start numbers, based on the assumption that United Energy's record is biased towards under reporting, Dr Diamond's report used two environmental parameters—monthly average maximum temperature and total rainfall of the previous month.

The AER, however, notes that the fire starts reported by United Energy and the historical events identified by United Energy as having potential to start a fire contain a significant number of fires or potential fire events that would not have been the direct result of temperature and rainfall, for example: ███████████████████
████████████. Hence, the AER sought advice from its technical consultant (SKM) on what are the prime causes of these kinds of fires and whether monthly average maximum temperature and total rainfall are the appropriate factors for analysing fire start records.

Additionally, the AER could not determine the robustness of the statistical approach from the analysis and information contained in the report. The report did not provide sufficient detail regarding the testing of alternative approaches, explanatory variables, assumptions or the underpinning statistical distributions. Also, the AER could not verify the accuracy of the analysis. Therefore, the AER requested that United Energy provide, where appropriate:

- a summary of supporting research and analysis (e.g., literature review, theoretical considerations and econometric analysis) conducted by the author for the preparation of this report; and

- the full source data (not limited to the data used for estimation results presented in table 1 of the report), together with the program codes (that record all the data transformation, data analysis and econometric analysis undertaken), and output files (in spreadsheet and/or text file); and

- any other relevant information—such as the reasonableness of the underlying assumptions (including choices of statistical models, and regression parameters), regression model specification, and estimation method (maximum likelihood regression)—on which, Dr Diamond's research findings were based.[31]

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[31]  AER, email to United Energy, 24 November 2011.

**Table 4.2.1:** Historical data —category of events previously classified as a fire by United Energy

| Fire Start by Category | Fire Start by Asset |
|---|---|

**Table 4.2.2:** Category of events that United Energy considered could have started a fire

### 4.2.2.1 SKM advice

SKM noted that it previously found the processes used by the DNSPs to collect fire start data were generally robust and well controlled—although some specific issues were identified.

SKM noted that in its experience:

■ Responsible utilities have historically placed a very high priority on identifying those asset issues which could lead to fire starts and potential loss of life. To suggest that fire starts were previously under-reported suggests that the issue is new prior to the f-factor scheme.

■ Issues related to the design, inspection and maintenance of network assets are, in general, the primary drivers in minimising the number of fire starts. Weather conditions (particularly wind, temperature and rain) are generally secondary issues which affect the <u>consequences</u> of any fire, rather than the total number of fire starts per annum. Obviously, the consequences of a fire start are greater under conditions of high fuel load, temperatures and wind.

SKM also considered that the data provided by the DNSPs, which was used to establish the target f-factor level, represents a balanced view on the number of likely fire starts.

SKM added the following comments on the Neil Diamond Report:

■ The statistical analysis by Dr Diamond fails to recognise the causal primacy of the network design, inspection and maintenance issues in affecting the number of annual fire starts. These issues are fully under the control of the DNSP. SKM suggested that analysis linking fire starts to weather data are potentially distracting from the main issues.

Retrospectively adding fire starts based on weather conditions suggests that fire starts from network assets were previously not a concern of the utility and were therefore under-reported.

In addition limiting the statistical correlation to temperature and rainfall misses the link between fire events and wind. Wind has the potential to cause debris to be blown in contact with energised lines, causing fire start. However, even with wind, the onus is on the utility to design, operate and maintain the infrastructure to be resistant to wind as well as other weather factors and it would be expected that this would be the asset management focus historically.[32]

### 4.2.2.2 United Energy's response to the AER's information request

In response to the AER's request, Dr. Neil Diamond submitted a report[33] and spreadsheets with modelling information as supporting evidence.

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[32] SKM, report, 30 November 2011.
[33] Report for United Energy prepared by Dr. Diamond, *Under-Reporting of Fire Starts: Supporting Evidence*, 30 November 2011

While the main report only presented the Generalised Poisson distribution model, the explanatory notes submitted by Dr. Neil Diamond subsequently further reviewed other distribution models considered by Neubauer *et al.* (2011) and literature of modelling under reporting.

In the explanatory notes, Dr. Diamond stated that:

- two additional distributional models, namely the Beta-binominal model and the usually defined Negative Binomial distribution model, had been considered, but they were found not as good as the Generalised Poisson distribution model reported based on the Bayesian Information Criterion.

- a fourth distribution model in Neubauer et al. (2001)— Beta-Poisson model—was also considered, but maximum likelihood estimation failed to converge.

The chosen starting values for the parameters are different across model specifications. The explanatory notes stated that various starting values were used and the same maximum value for the reported (Generalised Poisson distribution) model was obtained.[34]

### 4.2.2.3   AER analysis on the statistical report

The AER has reviewed the statistical report by Dr. Neil Diamond and the supporting evidence and has two main concerns with the approach.

**The statistical distributions adopted are inconsistent with the underlying data**

The AER considers that the proportion of unrecorded fire starts in every category would not be constant. The AER has discussed this issue fully in section 4.2.2.5 of this report. The AER considers that:

- Pole and cross arm fires would have been accurately recorded because they typically result in outage events and asset replacement that DNSPs must attend.

- HV cross arm fire events may have been over reported because United Energy reported related outage events as a fire unless ███████████████████[35]

- 316 of 560 fires, or 56 per cent of United Energy's fires, were related to pole and cross arm events.[36]

The distribution model adopted in Dr. Neil Diamond's report essentially assumes that 'for each fire start a random mechanism decides whether it is reported or not'.[37] This strong assumption of constant probability of reporting a fire start is not supported by the underlying data in a number of aspects, as noted above regarding pole and cross
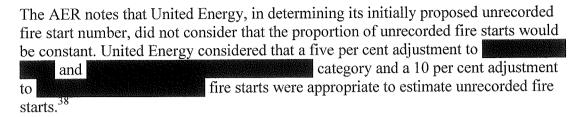
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[34]   Report for United Energy prepared by Dr. Diamond, *Under-Reporting of Fire Starts: Supporting Evidence*, 30 November 2011, p. 13.

[35]   United Energy, *RIN*, 29 August 2011

[36]   See appendix A.

[37]   Report for United Energy prepared by Dr. Diamond, *Under-Reporting of Fire Starts: Supporting Evidence*, 30 November 2011, p. 1.

arm fire start events. If under-reporting occurs to some categories of fire starts historically recorded, the use of underreporting model to the entire United Energy dataset without examining the nature and composition of the underlying data is still inappropriate.

The AER notes that United Energy, in determining its initially proposed unrecorded fire start number, did not consider that the proportion of unrecorded fire starts would be constant. United Energy considered that a five per cent adjustment to ███████████ ████ and █████████████████████████ category and a 10 per cent adjustment to ████████████████████████ fire starts were appropriate to estimate unrecorded fire starts.[38]

Additionally, the possibility of over-reporting may invalidate the application of the Neubauer et al. (2011) approach to modelling underreporting to the study of historical fire start data. The approach is predicated on the assumption that only under reporting could occur. With over-reporting for some fire-events, the assumption is violated.

Thus, the AER concludes that the proposed statistical method can lead to biased estimates in both probability and the estimated number of fire starts. In all, applying an under-reporting model to the entire United Energy dataset in the way adopted seems to be unjustifiable.

**Review of the regression model adopted**

A second order concern for the AER is that, based on the report and the explanatory notes, it appears that no alternative regression model specifications have been considered. The regression model for the monthly data only includes two explanatory variables, namely the monthly-average daily-maximum temperature and the lagged monthly-average rainfall.

While the two variables can explain some of the weather related month-to-month variations in fire starts, the model may fail to fully explain the patterns of monthly fire starts during the sample period 2006–10. Factors that may not be captured in the model include:

▪ Trend or series-break effect: for example, if the primary driver for fire starts—— which as noted by SKM are network design, maintenance and operation[39]—has changed over time.[40]

▪ Some of the seasonal effect: for example, as noted by SKM, another key weather-related driver of fire starts is wind speed—which was not included in the model:

▪ United Energy has also previously noted that wind is a driver of bushfires. United Energy's 2011-15 regulatory proposal stated that there was an increase in fire danger due to drought, high temperature

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[38] United Energy, *Further information pertaining to United Energy's response to the F-factor RIN*, 20 September 2011, p.5, 6.

[39] SKM, report, 30 November 2011, p. 3.

[40] The AER considers this likely given SKM's 19 September 2011 report which outlined that capital works programs specifically related to reducing fire risk were identified in all organisations.

and strong winds impacting on the cost of bushfire mitigation measures.[41]

■ Irregular events: The sample period covers a number of extreme weather seasons experienced in Victoria, such as December 2006, February 2007, February 2009 and March 2009, individually contributing 37, 40, 41 and 43 fire starts to the sampled total of 561. That is, fire starts occurring in these four months constitute 28.7 per cent of total number of fire starts in 60 months. 47 of the 60 months actually have ten or less fire starts in a month.

As this was the only regression model specification reported, there is no comparison to other model specifications that may fit or explain the data better.

Also, the approach does not take into account short term weather conditions—given monthly average temperature and previous months' rainfall are used. Additionally, it does not appear accurate to assume a linear relationship between rainfall and fire starts, because low levels of rainfall on individual days can cause a spike in the number of some types of fire start, for example pole fires.

**The Capture-Mark-Recapture report**

As noted in section 3.7, United Energy submitted the Capture-Mark-Recapture report to the AER on 2 December 2011 to support United Energy's 18 November 2011 proposal of 940 fire starts (or a target of 188).

Accordingly, the AER reviewed the Capture-Mark-Recapture report in the context of whether it supports Dr Diamond's analysis. The AER found that the Capture-Mark-Recapture report adopted a totally different statistical method. Using this best estimate of 1453 fires per year, the AER calculates that the Capture-Mark-Recapture report proposes that the number of fire starts for United Energy is 7,265 over the 2006–10 five-year period. This amount is extremely high when compared with United Energy's revised proposal of 940, the AER's draft decision of 621 and other DNSPs' fire starts—given that 7,265 fire starts is almost double the number of fire starts accepted by CitiPower, Powercor, SP AusNet and Jemena combined; while United Energy's line length and pole numbers account for approximately 8 per cent and 18 per cent respectively of the Victorian total. Additionally, the 95 per confidence interval of the Capture-Mark-Recapture report and Dr Diamond's report do not overlap. The AER, therefore, considered that the Capture-Mark-Recapture report was not relevant in assessing Dr Diamond's findings. Hence, no detailed assessment of the Capture-Mark-Recapture report was undertaken.

**4.2.2.4   AER conclusion on the Dr. Neil Diamond statistical report**

The AER concludes that the statistical approach used by Dr. Neil Diamond does not appear to be appropriate in the context of determining the number of actual fire starts. First (and fundamentally), the distribution assumptions adopted are inconsistent with

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[41]   Regulatory Proposal for Distribution Prices and Services, January 2011- December 2015, p. XXII
<http://www.google.com/url?q=http://www.ue.com.au/industry/regulatory/download/UED_EDPR
%25202011-
2015.pdf&sa=U&ei=q0HYTq7MG4KPiAKxgNEN&ved=0CAgQFjAC&client=internal-uds-
cse&usg=AFQjCNEB8tN7Ilzvw6o6bq2wEfsh8nZlLA>

the underlying data, which do not have a systematic under reporting problem as modelled in the report. Second, there is no sensitivity analysis to justify that the regression model specification adopted is robust. As a result, confidence cannot be laid on this application of statistical modelling, including the predictions from this statistical modelling.

#### 4.2.2.5 The appropriateness of the AER's draft decision method for setting unrecorded fire starts
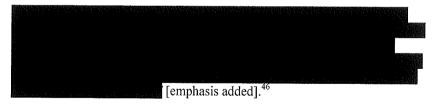
The AER considers the basis of the fire start target of 188 proposed by United Energy was inappropriate for the reasons outlined in section 4.2.2.3. The AER must set a fire start target and given the AER has rejected United Energy's statistical approach, the AER must apply an alternative method to determine the fire start number. The AER has already accepted Jemena's method for the reasons outlined in the draft decision.[42] However, this method needs to be re-examined in light of United Energy's submissions.

**ETS report - Robustness of data**

United Energy disagreed with the method outlined in the AER's draft decision (adopting Jemena's method) for estimating fire starts.[43]

United Energy stated it examined its data and has become aware of systematic under-reporting of fire starts.[44] ETS made an assertion that because United Energy's data system is focussed on network reliability, that its ability to accurately record fire starts is compromised. Hence, the reliance of the AER on the fire start data being largely definitive is flawed.[45]

The AER acknowledges that not all fires would have been recorded in the DNSPs' databases and so the AER allowed an adjustment to the fire start target. However, the AER does not accept that because the database focuses on network reliability, it would generally compromise the fire start data. United Energy has processes in place to attribute the causes of outages to fire. As noted by United Energy:

[emphasis added].[46]

Additionally, the AER does not accept that all fire start categories would be inaccurately recorded. The AER understands that some categories of fires have been reliably captured, particularly pole and cross arm fires, because they would typically result in supply outages. Further, United Energy outlined that

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[42] Jemena removed pole fires and then considered it would have recorded 80 per cent of all other fires.

[43] United Energy, *Previously unrecorded fires that are now covered by the Order*, 18 November 2011.

[44] United Energy, *Previously unrecorded fires that are now covered by the Order*, 18 November 2011.

[45] ETS, *Review of the F-factor draft determination as applied to United Energy*, 18 November 2011.

[46] United Energy, *RIN*, 29 August 2011

Thus, the AER considers fire starts in this category may even be over reported. As noted by United Energy 316 of 560 fires, or 56 per cent of United Energy's fires were related to pole and cross arm events[49], and are considered by the AER to be recorded with a high degree of accuracy.

The AER notes that Jemena's method of estimating unrecorded fire starts took the accuracy of reporting of pole top fires into account and hence appeared reasonable.[50] As such, the method the AER applied to United Energy had no adjustment to pole fires, for unrecorded fire starts. This was also appropriate because Jemena Asset Management was used by United Energy for asset management.

In United Energy's submission, United Energy advised that there could have been mistakes in its linemen's reports on pole fires.[51] As mentioned above, United Energy included [REDACTED]. Therefore it is very unlikely these pole fires would be under recorded. Additionally, based on SKM's advice, the AER does not consider that the level of any error would be high. Therefore, the AER still considers United Energy's overall pole figure number to be relatively accurate.

The AER notes that United Energy did not raise significant concerns with the robustness of its data prior to the AER's draft decision, nor has any other DNSP submitted such concerns. Also, the AER's consultant conducted interviews with all DNSPs including United Energy, and found that all DNSPs' data represented a balanced and robust view on the number of fire starts.[52] While the AER acknowledges that there are some questions regarding the reliability of United Energy's fire start data (which is why the AER allowed an estimate of unrecorded fire starts), the AER considers it has sufficient evidence regarding the accuracy of this data to use it as a basis for setting a fire start target.

Finally, the AER considers the actual fire starts submitted by United Energy are not in contention. The AER accepted, in the draft decision, the actual fire starts initially proposed by United Energy (but for a handful of duplicate records).

**ETS report – other issues**

In the AER's draft determination, the AER considered:

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[47] United Energy, *RIN*, 29 August 2011

[48] United Energy recorded low voltage cross arm fires differently, however, from attending discussions with DNSPs, the AER understands HV cross arm fires are the most common type of crossarm fire. Additionally, LV cross arm fires would still result in an outage and hence be inspected by linesmen.

[49] See appendix A, and Report by Rho Environmetrics Pty Ltd together with John Field Consulting Pty Ltd, *Examination of an assumption used by the AER in estimating target fire starts for United Energy*, 18 November 2011.

[50] AER, *Draft determinations and Explanatory statement for the draft determinations*, 5 October 2011, p. 15, 18.

[51] United Energy, *Previously unrecorded fires that are now covered by the Order*, 18 November 2011, p. 2.

[52] SKM, *F-Factor Incentive Scheme Final*, 19 September 2011, p.17.

> Given SKM's assessment that the DNSPs' reporting is robust, the AER considered an assumption that 10 per cent of fire starts were not recorded, possibly arising from different historical reporting requirements, would be reasonable to account for previously unrecorded fire starts for United Energy. The AER also considers its adjustment is more likely to be closer to the number of unrecorded fire starts than that proposed by United Energy.[53]

ETS submitted the AER provided no basis for its conclusion in the draft decision that it is reasonable 10 per cent of fire starts were not recorded.

The AER's judgment that 10 per cent of fires were not recorded, was not used as the basis for setting United Energy's fire start target. To set United Energy's target, the AER excluded pole and cross arm fires (which, as discussed are very likely to be recorded accurately) and then escalated the remaining actual fire starts by 25 per cent.

However, the AER agrees with ETS that there was no exact basis for:

- Assuming it reasonable that 10 per cent of United Energy's overall fire starts were not recorded.

- The size of the 25 per cent adjustment.

The AER acknowledges there is a financial risk to DNSPs in setting the fire start target too low. However, just as importantly there is a financial risk to consumers of setting the target too high. The AER recognises that there is unlikely to be any precise method for determining the exact number of unrecorded fire starts. Therefore, the method applied in the draft decision included the AER's judgment on the likely number of unrecorded fire starts, which is based on:

- The observation that Jemena Asset Management, United Energy's sole network operational and maintenance service provider, was shared with Jemena—which considered a 25 per cent adjustment to non pole or cross arm fires appropriate.[54]

- SKM's consideration that the DNSPs' data is a balanced and robust view on the number of fire starts associated with each DNSP's network.[55]

ETS also noted that a 2 per cent variation to United Energy's uplift factors (in the approach initially proposed by United Energy) would result in an additional 28.2 fires—more than the number of fires allocated to United Energy by the AER—thus suggesting the AER's draft determination may be low.[56] The AER does not consider this to be evidence that the AER's draft target is on the low side because, as noted in the draft decision:

> as United Energy identified a large number of potential fire start events, a small difference in the assumption of the percentage of any particular

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[53] AER, *Draft determinations and Explanatory statement for the draft determinations*, 5 October 2011, p. 18.

[54] Jemena considered this approach appropriate in its initial submission and accepted the AER's draft decision which accepted the approach.

[55] SKM, *F-Factor Incentive Scheme Final*, 19 September 2011.

[56] ETS, *Review of the F-factor draft determination as applied to United Energy*, 18 November 2011.

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category of such events that would have resulted in fire starts, will have a
large impact on the total fire start numbers. Thus, the AER considers that
United Energy's approach is prone to generate substantive errors.[57]

This submission further demonstrates the AER's concern with United Energy's
initially proposed method to determine unrecorded fire starts.

**Rho Environmetrics and John Field Consulting report**

United Energy submitted statistical analysis, which indicated that there are significant
differences in the patterns of the recorded fires between United Energy and Jemena.
The report considered this casts doubt on the AER's assumption that the proportion of
unrecorded fires is the same for Jemena and United Energy.[58]

The AER does not dispute there may be differences in the recorded fires between
United Energy and Jemena. There are many reasons this could be the case including
different bushfire mitigation programs and wooden pole arm replacement programs.
However, this does not invalidate the AER's assumption of a common proportion of
unrecorded fire starts for United Energy and Jemena. Given that Jemena Asset
Management was the common asset manager for Jemena and United Energy, it is
likely that the proportion of unrecorded fires would be similar, regardless of how
many fires actually occurred in any given fire start category.

#### 4.2.2.6 Submissions on the AER's reasons for rejecting United Energy's initial unrecorded fire start claims

ETS questioned the AER's observation that the number of unrecorded fires under any
category should not be larger than recoded fires. United Energy has not resubmitted
its initial approach to estimating unrecorded fire starts and that approach was not
accepted by the AER in the draft decision. Nevertheless, in the draft decision the AER
noted that United Energy submitted ▓ actual recorded fires resulting from animal
contact with network assets in their updated RIN, but submitted ▓ additional
estimated fires starts relating to ▓▓▓▓▓▓▓▓▓▓▓▓▓▓.[59] In other
words, United Energy' initial submission for this fire start category suggested that
there were more than five times the number of unrecorded fire starts than actual
recorded fire starts. The AER still considers this claim to be beyond what could be
reasonably considered reliable.

#### 4.2.2.7 Accuracy of the Dr Neil Diamond's report and the AER's method

Using its judgment and further to the reasons already noted, the AER considers the
fire start adjustment in the draft decision to be more reliable than that outlined in
Dr Neil Diamond's report for the reasons outlined in this section.

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[57] AER, *Draft determinations and Explanatory statement for the draft determinations*, 5 October 2011, p. 17.
[58] Report by Rho Environmetrics Pty Ltd together with John Field Consulting Pty Ltd, *Examination of an assumption used by the AER in estimating target fire starts for United Energy*, 18 November 2011.
[59] United Energy, *Updated RIN and RIN Cover letter*, 21 September 2011. The AER notes that the two categories compared in this example may not contain exactly the same type of events. However, the AER still considers the discrepancy to be large.

The AER has found that for United Energy, by removing actually recorded pole and cross arm fires (316), which are considered highly accurately recorded, from the 560 actually recorded fire starts leaves 244 fires in categories where unrecorded fire starts may have occurred.

By proposing 940 fire starts, United Energy is equivalently making an adjustment for unrecorded fire starts, based on the actually recorded fire starts other than pole and cross arm fires, of 155 per cent. Thus, United Energy's proposal suggests that only 2 out of every 5 fire start events other than pole fires are recorded (less recorded fire starts than those not recorded). The AER's draft decision assumes 4 out of 5 fire starts other than pole fires are recorded.

Given SKM's comments that responsible utilities have historically placed a very high priority on identifying those asset issues which could lead to fire starts and potential loss of life, the AER does not consider it likely United Energy only recorded 2 of 5 fire starts.[60] Additionally, CitiPower, Powercor and SP AusNet did not see the need to make any adjustment for unrecorded fire starts and Jemena only made an adjustment of 20 per cent to non pole and cross arm fires. The AER thus considers its approach more accurate than that submitted by United Energy.[61]

### 4.2.2.8 AER conclusions on the appropriateness of applying the method outlined in the draft decision

The AER recognises that there is unlikely to be any precise method for determining the exact number of unrecorded fire starts. However, the AER is not satisfied that United Energy's proposed statistical approach contains the assumptions necessary to be an unbiased proposal. Therefore, the AER has rejected the use of this model to set United Energy's fire start target.

The AER has used its judgement in balancing the financial risks to United Energy and to consumers. The AER considers it has sufficient evidence on the accuracy of United Energy's data to use this data as a basis for setting a fire start target and as noted, it is likely pole and cross arm fires would have been accurately recorded and hence no adjustment is necessary. The AER has then allowed a 25 per cent increase in the number of recorded fires to account for unrecorded fire starts. This was the method proposed and considered reasonable by Jemena—which shared asset managers with United Energy.

While the AER has assessed the submissions made by United Energy, including the method adopted and assumptions made by Dr Neil Diamond in his report, the AER considers its assumptions to be more robust and its approach to be preferable. As set out above, the AER's assumptions, and those of its consultant SKM, take into account the nature of the underling fire start information unlike the Dr. Diamond report, and the quantities of fire starts indentified by the other four Victorian DNSPs. The AER

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[60] The AER considers United Energy would not be an irresponsible DNSP in terms of network operation and maintenance given that its supply reliability has been similar to other Victorian DNSPs with similar network characteristics. See Victorian comparative performance report 2009 p. 43-46.

[61] SKM also considered that the data provided by the DNSPs, which was used to establish the target f-factor level, represents a balanced view on the number of likely fire starts

acknowledges that even though its determination of a fire start target for United Energy is based on United Energy's actual data, it is an estimate. Clause 9(2) of the Order states that in determining the number of fire starts that occurred in relation to a distribution system, if there is no or incomplete data for fire starts, or the AER considers the data or any part thereof inadequate for any reason, the AER may use estimates. The fact that the estimate is not derived from a statistical approach does not make it incorrect or unreasonable.

On this basis, the AER's final decision is to adopt the method outlined in the draft decision to increase United Energy's non pole or cross arm related fires by 25 per cent to account for unrecorded fire starts. United Energy's fire start target will be set at 124.2.

### 4.2.3    Other submissions

CFA was concerned at the extent of redaction in the draft decision because it limits the opportunity for critical review. The CFA welcomed an open exchange of data, under confidential arrangements if necessary.[62]

The AER considers that the disclosure of the information will enable stakeholders and the public to have a better understanding of the how the fire start targets for Victorian DNSPs was derived and how the f-factor scheme will work. The AER is of the opinion that the disclosure of the information would not cause detriment to the DNSPs, alternatively, the public benefit in disclosing the information outweighs any detriment to the DNSPs. Therefore, the AER considers that it is authorised by section 28ZB(1) to disclose the following information[63]:

■   aggregated historical fire start numbers for the five year period 2006-10 by the fire start categories set out in AER's fire start data Regulatory Information Notice issued on 8 August 2011, as determined by the AER for the purpose of making the f-factor scheme determination for the 2011-2015 period under the *f-factor scheme order*.

Therefore, in appendix A, the AER has provided a table outlining the fire starts by category as approved in the draft decision.

United Energy also sought further clarification on what constitutes a fire start. It submitted that definitions include that the three characteristics heat, light and flames must be or have been present. It considered this definition would align with the common use of the word 'fire'.[64] The AER considers the definition of a fire start to be contained in the Order. The AER will discuss this issue further when setting out DNSPs' future reporting framework. However, as noted in the draft decision, the

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[62]   CFA, *Submission to f-factor scheme draft determination*, 18 November 2011.

[63]   The AER has complied with the consultation process provided in s. 28ZB of the National Electricity Law for disclosure of information given in confidence. Initial disclosure notice were given to CitiPower, Powercor, United Energy and SP AusNet on 7 November 2011 and further disclosure notices were given to these DNSPs on 5 December 2011. The restricted period as per s. 28ZB(8) of the National Electricity Law has ceased.

[64]   United Energy, *Previously unrecorded fires that are now covered by the Order*, 18 November 2011.

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AER considers that to the extent consistent with the Order, ongoing fires should be recorded in the way in which the fire start target is set.[65]

## 4.3    AER final decision on fire start targets

**Table 4.3.1    AER final decision on fire start target for Victorian DNSPs 2012–15, compared with AER's draft determination**

| DNSP | Final fire Start Target determined by the AER | Draft fire Start Target determined by the AER |
|------|-----------------------------------------------|-----------------------------------------------|
| CitiPower | 30.4 | 30.4 |
| Powercor | 401.8 | 401.8 |
| Jemena | 56.8 | 56.8 |
| SP AusNet | 256.8 | 256.8 |
| United Energy | 124.2 | 124.2 |

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[65]    AER, *Draft determinations and Explanatory statement for the draft determinations*, 5 October 2011, p. 27.

# 5 F-factor scheme determinations

This section outlines the AER's f-factor scheme final determinations for each DNSP.

## 5.1 CitiPower f-factor scheme determination

Under clause 6(1) of the F-factor Scheme Order 2011 (the Order) made under section 16C of the National Electricity (Victoria) Act 2005, the Australian Energy Regulator (AER) must make an f-factor scheme determination in relation to CitiPower Pty Ltd (ABN 76 064 651 056) (CitiPower). Under clause 6(2) of the Order, the AER must make, no later than 31 December 2011, an f-factor scheme determination to take effect in the first distribution determination period. The first distribution determination period is the period of 1 January 2011 to 31 December 2015.

Under clause 7(1) of the Order, an f-factor scheme determination must establish an f-factor scheme that complies with the Order and under which there is a revenue adjustment for a DNSP.

In accordance with clause 7(2) of the Order the revenue adjustment for CitiPower must be determined by the AER as follows:

$$Revenue\ adjustment_{t,n} = \sum_{m=1}^{q} Incentive\ rate_{t-2,n,m} \times (Target\ no.\ of\ fires_{t-2,n,m} - Number\ of\ fires_{t-2,n,m})$$

where the distribution system is made up of $q$ parts and–

(a) **Revenue adjustment$_{t,n}$** is the adjustment to the revenue for Distribution Network Service Provider $n$ for regulatory year $t$;

(b) **Incentive rate$_{t-2,n,m}$** is the incentive rate for part $m$ of distribution system $n$ for regulatory year $t-2$, determined in accordance with clause 10 or 11 of the Order as the case may be;

(c) **Target no. of fires$_{t-2,n,m}$** is the fire start target for regulatory year $t-2$ for part $m$ of distribution system $n$, determined in accordance with clause 8 of the Order; and

(d) **Number of fires$_{t-2,n,m}$** is the number of fire starts in relation to part $m$ of distribution system $n$ that occurred in regulatory year $t-2$, determined in accordance with clause 9 of the Order.

In accordance with clause 8(1) of the Order the AER determines that for the first distribution determination period the target number of fire starts for CitiPower is 30.4.

Under clause 10 of the Order the incentive rate for the first distribution period is $25,000.

## 5.2 Jemena f-factor scheme determination

Under clause 6(1) of the F-factor Scheme Order 2011 (the Order) made under section 16C of the National Electricity (Victoria) Act 2005, the Australian Energy Regulator (AER) must make an f-factor scheme determination in relation to Jemena Electricity Networks (Victoria) ABN 82 064 651 083 (Jemena). Under clause 6(2) of the Order, the AER must make, no later than 31 December 2011, an f-factor scheme determination to take effect in the first distribution determination period. The first distribution determination period is the period of 1 January 2011 to 31 December 2015.

Under clause 7(1) of the Order, an f-factor scheme determination must establish an f-factor scheme that complies with the Order and under which there is a revenue adjustment for a DNSP.

In accordance with clause 7(2) of the Order the revenue adjustment for Jemena must be determined by the AER as follows:

$$Revenue\ adjustment_{t,n} = \sum_{m=1}^{q} Incentive\ rate_{t-2,n,m} \ x \ (Target\ no.\ of\ fires_{t-2,n,m} - Number\ of\ fires_{t-2,n,m})$$

where the distribution system is made up of $q$ parts and–

(a) *Revenue adjustment$_{t,n}$* is the adjustment to the revenue for Distribution Network Service Provider $n$ for regulatory year $t$;

(b) *Incentive rate$_{t-2,n,m}$* is the incentive rate for part $m$ of distribution system $n$ for regulatory year $t-2$, determined in accordance with clause 10 or 11 of the Order as the case may be;

(c) *Target no. of fires$_{t-2,n,m}$* is the fire start target for regulatory year $t-2$ for part $m$ of distribution system $n$, determined in accordance with clause 8 of the Order; and

(d) *Number of fires$_{t-2,n,m}$* is the number of fire starts in relation to part $m$ of distribution system $n$ that occurred in regulatory year $t-2$, determined in accordance with clause 9 of the Order.

In accordance with clause 8(1) of the Order the AER determines that for the first distribution determination period the target number of fire starts for Jemena is 56.8.

Under clause 10 of the Order the incentive rate for the first distribution period is $25,000.

## 5.3 Powercor f-factor scheme determination

Under clause 6(1) of the F-factor Scheme Order 2011 (the Order) made under section 16C of the National Electricity (Victoria) Act 2005, the Australian Energy Regulator (AER) must make an f-factor scheme determination in relation to Powercor Australia Ltd ABN 89 064 651 109 (Powercor). Under clause 6(2) of the Order, the AER must make, no later than 31 December 2011, an f-factor scheme determination to take effect in the first distribution determination period. The first distribution determination period is the period of 1 January 2011 to 31 December 2015.

Under clause 7(1) of the Order, an f-factor scheme determination must establish an f-factor scheme that complies with the Order and under which there is a revenue adjustment for a DNSP.

In accordance with clause 7(2) of the Order the revenue adjustment for Powercor must be determined by the AER as follows:

$$Revenue\ adjustment_{t,n} = \sum_{m=1}^{q} Incentive\ rate_{t-2,n,m} \times (Target\ no.\ of\ fires_{t-2,n,m} - Number\ of\ fires_{t-2,n,m})$$

where the distribution system is made up of $q$ parts and–

(a) **Revenue adjustment$_{t,n}$** is the adjustment to the revenue for Distribution Network Service Provider $n$ for regulatory year $t$;

(b) **Incentive rate$_{t-2,n,m}$** is the incentive rate for part $m$ of distribution system $n$ for regulatory year $t-2$, determined in accordance with clause 10 or 11 of the Order as the case may be;

(c) **Target no. of fires$_{t-2,n,m}$** is the fire start target for regulatory year $t-2$ for part $m$ of distribution system $n$, determined in accordance with clause 8 of the Order; and

(d) **Number of fires$_{t-2,n,m}$** is the number of fire starts in relation to part $m$ of distribution system $n$ that occurred in regulatory year $t-2$, determined in accordance with clause 9 of the Order.

In accordance with clause 8(1) of the Order the AER determines that for the first distribution determination period the target number of fire starts for Powercor is 401.8.

Under clause 10 of the Order the incentive rate for the first distribution period is $25,000.

## 5.4 SP AusNet f-factor scheme determination

Under clause 6(1) of the F-factor Scheme Order 2011 (the Order) made under section 16C of the National Electricity (Victoria) Act 2005, the Australian Energy Regulator (AER) must make an f-factor scheme determination in relation to SPI Electricity Pty Ltd ABN 91 164 651 118 (SP AusNet). Under clause 6(2) of the Order, the AER must make, no later than 31 December 2011, an f-factor scheme determination to take effect in the first distribution determination period. The first distribution determination period is the period of 1 January 2011 to 31 December 2015.

Under clause 7(1) of the Order, an f-factor scheme determination must establish an f-factor scheme that complies with the Order and under which there is a revenue adjustment for a DNSP.

In accordance with clause 7(2) of the Order the revenue adjustment for SP AusNet must be determined by the AER as follows:

$$Revenue\ adjustment_{t,n} = \sum_{m=1}^{q} Incentive\ rate_{t-2,n,m} \times (Target\ no.\ of\ fires_{t-2,n,m} - Number\ of\ fires_{t-2,n,m})$$

where the distribution system is made up of $q$ parts and–

(a) **Revenue adjustment$_{t,n}$** is the adjustment to the revenue for Distribution Network Service Provider $n$ for regulatory year $t$;

(b) **Incentive rate$_{t-2,n,m}$** is the incentive rate for part $m$ of distribution system $n$ for regulatory year $t-2$, determined in accordance with clause 10 or 11 of the Order as the case may be;

(c) **Target no. of fires$_{t-2,n,m}$** is the fire start target for regulatory year $t-2$ for part $m$ of distribution system $n$, determined in accordance with clause 8 of the Order; and

(d) **Number of fires$_{t-2,n,m}$** is the number of fire starts in relation to part $m$ of distribution system $n$ that occurred in regulatory year $t-2$, determined in accordance with clause 9 of the Order.

In accordance with clause 8(1) of the Order the AER determines that for the first distribution determination period the target number of fire starts for SP AusNet is 256.8.

Under clause 10 of the Order the incentive rate for the first distribution period is $25,000.

## 5.5 United Energy f-factor scheme determination

Under clause 6(1) of the F-factor Scheme Order 2011 (the Order) made under section 16C of the National Electricity (Victoria) Act 2005, the Australian Energy Regulator (AER) must make an f-factor scheme determination in relation to United Energy Distribution ABN 70 064 651 029 (United Energy). Under clause 6(2) of the Order, the AER must make, no later than 31 December 2011, an f-factor scheme determination to take effect in the first distribution determination period. The first distribution determination period is the period of 1 January 2011 to 31 December 2015.

Under clause 7(1) of the Order, an f-factor scheme determination must establish an f-factor scheme that complies with the Order and under which there is a revenue adjustment for a DNSP.

In accordance with clause 7(2) of the Order the revenue adjustment for United Energy must be determined by the AER as follows:

$$Revenue\ adjustment_{t,n} = \sum_{m=1}^{q} Incentive\ rate_{t-2,n,m} \times (Target\ no.\ of\ fires_{t-2,n,m} - Number\ of\ fires_{t-2,n,m})$$

where the distribution system is made up of $q$ parts and–

(a) **Revenue adjustment$_{t,n}$** is the adjustment to the revenue for Distribution Network Service Provider $n$ for regulatory year $t$;

(b) **Incentive rate$_{t-2,n,m}$** is the incentive rate for part $m$ of distribution system $n$ for regulatory year $t-2$, determined in accordance with clause 10 or 11 of the Order as the case may be;

(c) **Target no. of fires$_{t-2,n,m}$** is the fire start target for regulatory year $t-2$ for part $m$ of distribution system $n$, determined in accordance with clause 8 of the Order; and

(d) **Number of fires$_{t-2,n,m}$** is the number of fire starts in relation to part $m$ of distribution system $n$ that occurred in regulatory year $t-2$, determined in accordance with clause 9 of the Order.

In accordance with clause 8(1) of the Order the AER determines that for the first distribution determination period the target number of fire starts for United Energy is 124.2.

Under clause 10 of the Order the incentive rate for the first distribution period is $25,000.

# A Appendix

**Table A    Fire starts approved by the AER in its draft decision, by category**

| Fire Start by Category | Fire Start by Asset | CitiPower | Powercor | Jemena | SP AusNet | United Energy |
|---|---|---|---|---|---|---|
| Asset failures resulting in grass/vegetation fire | Pole and cross arm failure or Pole and cross arm fire | 2 | 67 | 0 | 37 | 9 |
| | Oil-filled plant | 0 | 4 | 1 | 6 | 4 |
| | HV Fuse | 0 | 40 | 0 | 33 | 3 |
| | Other Assets | 7 | 208 | 14 | 203 | 40 |
| | Any fire triggered by any asset failure caused by Lightning | 0 | 19 | 1 | 6 | 0 |
| Grass/vegetation fires due to animals | Fire starts in grass/vegetation resulting from animal contact with network assets | 0 | 65 | 3 | 27 | 12 |
| Asset failures resulting in asset fire (no grass/vegetation fire) | Pole and cross arm fire (including 'smouldering' or 'smoke') | 39 | 1176 | 234 | 342 | 307 |
| | Oil-filled plant fire | 2 | 2 | 0 | 50 | 14 |
| | HV Fuse Failure (including 'hang-ups' and 'candling') | 1 | 302 | 3 | 466 | 52 |
| | Other Assets | 77 | 28 | 13 | 103 | 46 |
| | Any fire triggered by any asset failure caused by Lightning | 0 | 3 | 0 | 11 | 0 |
| Any other Fire Start | Any additional fires, caused by any asset failure, not reported to the ESV and required to be reported by the OIC | 0 | 0 | 0 | 0 | 27 |
| Other[a] | | 24 | 95 | 7 | | 46 |
| **Total** | | **152** | **2009** | **276** | **1284** | **560** |

[a] 'Other' was not a category provided by the AER to the DNSPs in the RIN. Several DNSPs submitted additional categories to those required to be reported against, which the AER has now categorised as 'Other' for this table.