'Prices-to-Devices' Tariffs: Developing a more cost reflective EV Tariff for Victoria

Energy Consumers Australia

Friday 5 June 2020

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Executive Summary 1/2

- Victorian Distribution Network Service Providers(DNSPs) have proposed implementing a new, common ToU tariff for new customers, customers changing their electrical installation, including the installation of solar PV and Level 2 electric vehicle charging. The rate has been designed to avoid negatively impacting vulnerable customers and to be easy for customers to understand. The prices will be in place for the next 5 years, which is a crucial time in terms of solar PV, behind the meter storage and EV adoption.
- Grid load has traditionally been considered relatively inelastic in electricity markets, due to the lack of cost-effective substitutes or storage. Rooftop solar PV, vehicle electrification, behind the meter storage and smart appliances are rapidly altering the potential for load flexibility. However, the pace of this technology depends on the existence of efficient price signals, without them, consumers will under invest in lower cost technology in favour of higher cost grid services.
- Energeia was engaged by Energy Consumers Australia (ECA) to develop Rules compliant rate designs for Victorian consumers that to identify the potential impacts it could have on the long-term interests of Victorian consumers. The tariffs were assumed to be voluntary, and technology or expert agent facilitated, enabling greater freedom to design efficient and effective rates compared to a mandatory tariff that all consumers may be subjected to.
- Energeia's in-depth analysis of network and generation peak demand, including spatial peak demand, found that adjusting for 1 in 10 year weather, and underlying trends in demand, resulted in peak period definitions that were 98-99% different to current periods in Victoria with a 98-99% reduction in the duration of the peak period overall.
- Energeia's analysis of DNSP Regulatory Information Notice (RIN) data and DNSP Long Run Marginal Cost (LRMC) calculations found that current LRMC estimates include 2-20%[1] of DNSP approved total expenditure (totex), despite the Rules definition of LRMC being defined to be the period over which all costs are variable[2]. Energeia's RIN based estimate of DNSP LRMC, which includes 50% of repex, found them to be 2-5 times higher.

Note: 1: In the cases of AusNet and Jemena. 2. As defined in Chapter 10 of the NER

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Executive Summary 2/2

- Bringing together our findings of a 98-99% shortened peak period definitions and significantly increased LRMC, Energeia then assessed their impacts on first order customer bills, second order customer behavior, and third order long-term system costs and customer bills – compared to current flat/inclining block rates and proposed ToU rates. Our key findings included:
  - Customers without solar PV or EVs would be no worse off on average
  - Customers with electric vehicles could save $86 more per year on average per EV if they modified that load to avoid the peak period, compared to the DNSP ToU
- Although out of scope for this project, Energeia identified:
  - Consumer costs could be further reduced if low-voltage costs could be unbundled from the over all network tariff. This is a necessary first step to enabling peer-to-peer trading solutions, which would enable consumers on the same LV circuit to manage the over and under utilization of their solar, storage and electric vehicle assets
  - Peer-to-peer trading could enable local optimisation of lowest cost electricity supply, and reduce consumer's exposure to the full build up of distribution network, transmission network and wholesale market costs in the unbundled bill.

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Project Context, Background and Objectives

Project Background and Objectives

2021-26 Determination

- The Victorian DNSPs are putting forward a new ToU tariff that would only apply to customers with new or replacement meters on an opt-out basis. In combination with a relatively unambitious tariff assignment position for the new tariff, the proposed structure provides minimal incentive to shift consumption away from the peak, particularly for those with intelligent devices.
- While EV adoption may be limited in the 2021-26 regulatory period, it is important to set norms in advance of mass market take up or acceleration, so as to incentivise new demand management business models and to condition the correct consumer behaviour and avoid potential issues later.

Developing a more cost reflective EV Tariff for Victoria

- In view of the above context, we understand that the ECA's objective for this work is for Energeia to review existing EV/tech neutral tariffs offered by other networks/retailers and develop best practice, incentive-driven, NER compliant and voluntary tariffs, which will drive the right technology-enabled responses for consumers (i.e. "prices-to-devices") .
- The project will develop cost reflective pricing (both structure and rates) for EV-drivers in Victoria. These tariffs can act as a benchmark for the approach that ECA believes the Victorian and other Australian DNSPs should consider in the development of their regulatory proposal.
- This project will both be an exercise in designing tariffs according to best practices (i.e. how cost reflective prices should be developed), and at the same time, a demonstration of the benefits to customers of strongly reflective prices (in this case, EV customer adoption of the price).

Scope and Approach

Energeia's Approach

	Stage > Task		Objective	Sub-Tasks
	0	Project Management and Governance	Management to agreed parameters	Weekly risk and issues management; weekly plan and controls update
Network Tariff Optimisation	1.1	Update Model Inputs	Develop a cost-reflective network tariff for EV customers	Update in-house models for the five Victorian DNSPs
	1.2	Develop Optimal Network Tariff Structure		Estimate the peak period and LRMC, and develop an efficient tariff structure that minimises cross subsidies
	1.3	Estimate Retail Overlay		Mark-up the developed network prices based on historic retailer behaviours
	1.4	Validate Outcomes		Present our findings and conclusions to ECA
Customer Bill Impact Assessment	2.1	Assess 1st Order (Immediate) Impacts	Assess the consumer benefits for EV drivers (and the effect on non-EV drivers)	Analyse the bill impacts and distributional effects
	2.2	Estimate 2nd Order Impacts (EV return on investment for consumers)		Estimate the impact on EV uptake attractiveness and outcomes
	2.3	Model 3rd Order Impacts (Long Term Outcomes)		Examine longer-term impacts on network costs, investment and revenue recovery
	2.4	Validate Outcomes		Present our findings and conclusions to ECA

- Energeia has split our workplan into two stages
  - ***Network Tariff Optimisation*** – this step will deliver a highly cost reflective EV tariff for the Victorian DNSPs, on the basis of an optimised peak period, LRMC and structure
  - ***Consumer Bill Impact Assessment*** – we will then take our optimised network tariffs and assess their primary (immediate consumer bill savings), secondary (DER incentives and cross-subsidies) and tertiary (long term) order impacts

Source: Energeia; Note: 3rd Order impacts (Step 2.3) are to be updated in future editions of this work

Background

Victorian Electricity Determination Process

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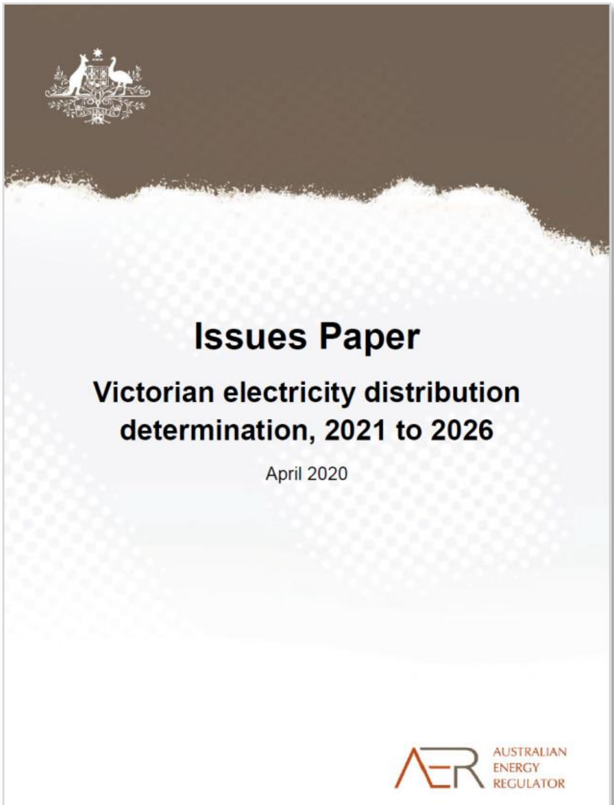
AER Issues Paper – Tuesday 7 April 2020

AER Issues Paper – 7 April


Issues Paper

Victorian electricity distribution determination, 2021 to 2026

April 2020

AER AUSTRALIAN ENERGY REGULATOR

"The five Victorian distributors have proposed a largely common tariff strategy across their Tariff Structure Statements (TSS). For residential and small business customers, the distributors propose to focus tariff reform on those customers who install DER such as rooftop solar, a home battery or an electric vehicle."

"In addition, tariff reform is proposed for retailers of customers with new connections and customers who upgrade from single phase to three phase power. […] A default time-of-use tariff will be charged to retailers for residential customers, with a peak charging window set as 3pm to 9pm and off-peak rates at all other times [i.e. both weekends and weekdays]"

"The Victorian distributors' proposed tariff assignment policies are to charge retailers a cost reflective network tariff by default for customers who install DER, are a new connection or upgrade to three phase power […]. Apart from AusNet Services, the distributors have proposed that retailers can opt-out of tariff reform and avoid facing a cost reflective network tariff. AusNet Services has proposed that for solar PV customers, the retailer can choose between a time-of-use or demand tariff, but cannot opt-out of tariff reform [altogether]."

"Tariff assignment policy will be a focus of our review. We plan to review whether the proposals provide a sufficient financial incentive for retailers to innovate and reform their offers to meet the needs and preferences of a diverse set of customers and to meet the challenges of the energy system transition at lowest cost to customers overall."

Source: AER (2020), 'Issues Paper Victorian electricity distribution determination, 2021 to 2026', pg. 18-20

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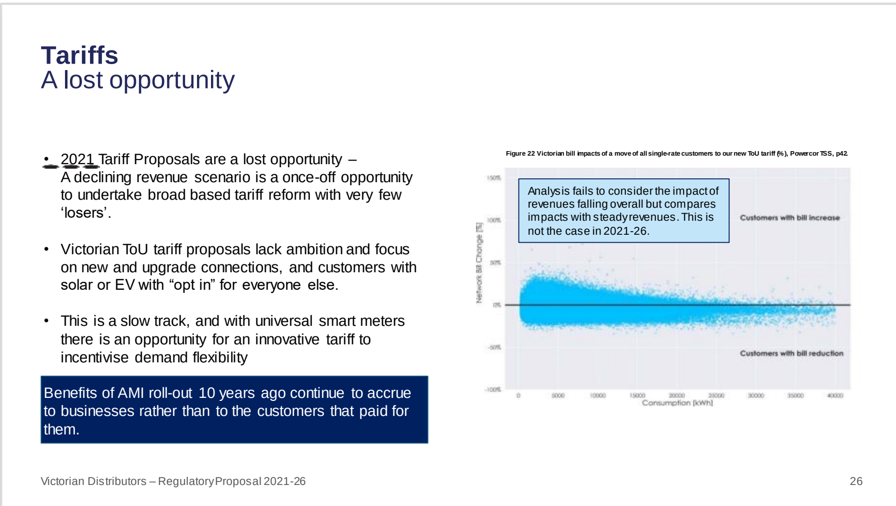
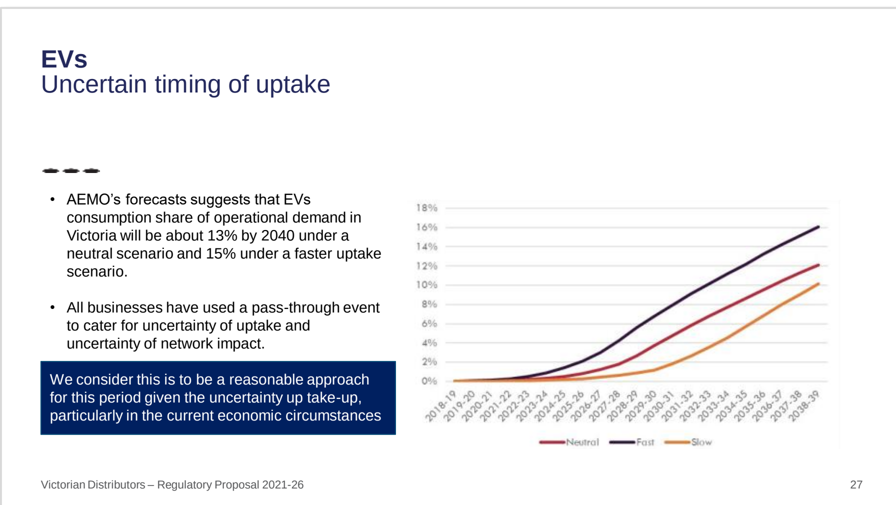
AER Public Forum – Wednesday 22 April 2019



Source: Victorian Electricity Determination Public Forums, Response by Energy Consumers Australia, April 2020



Source: Victorian Electricity Determination Public Forums, Response by Energy Consumers Australia, April 2020

- Due to the COVID-19, the public forum was facilitated by remotely by the AER
- The ECA submission highlighted two network tariff issues impacting on this study:
  - Firstly, the lack of ambition of the Victorian ToU design, given the revenue decline in Victoria and the roll out of AMI across the state
  - Secondly, the uncertainty of the timing of EV uptake impacting on forecast consumption
- This study will help make the case for more ambitious cost reflective tariffs (in both design and in assignment) for EVs by demonstrating how an optimised tariff design can deliver net benefits to EV drivers and non-EV drivers alike
  - Electricity bill and petrol savings
  - Avoided cross-subsidies
  - Removal of barriers to efficient EV adoption
  - Strong incentives for managing EV charging

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Background

Best Practice Electric Vehicle Tariff Design

International EV Tariffs are typically ToU

Summary of International Best Practice EV Tariffs

Region	Jurisdiction	Utility	Residential Tariff Type			EV Incentives - Tariff and Non-Tariff[1]		
			Default	Alternative	EV Charging	Energy Rate ($/kWh)[2]	Controlled Load[3]	Structural Changes[4]
US	California	PG&E	IBT	Seasonal ToU	Seasonal ToU	✗	✗	✓
		LADWP	Seasonal IBT	Seasonal ToU	Seasonal ToU	✓	✗	✗
		SDG&E	Seasonal IBT	Seasonal ToU	Seasonal ToU	✓	✗	✗
		SCE	IBT	Seasonal ToU	Seasonal ToU	✓	✗	✗
	Hawaii	HECO	IBT	ToU	ToU	✗	✗	✓
	New York	Con Ed	Seasonal IBT	Seasonal ToU	Seasonal ToU	✓	✗	✗
	Minnesota	Xcel	Seasonal Flat	Seasonal ToU	Seasonal ToU	✗	✗	✗
	Texas	Austin Energy	IBT	Seasonal ToU	Seasonal ToU	✗	✗	✓
Europe	Norway	Hafslund Nett	Flat	Seasonal Flat	N/A	N/A	N/A	N/A
	Netherlands	essent	Flat	ToU	N/A	N/A	N/A	N/A
	UK	Octopus Energy	Flat	ToU	ToU	✓	✗	✓
	Germany	entega energie	Flat	N/A	N/A	N/A	N/A	N/A
Asia	Japan	TEPCO	IBT	ToU	N/A	N/A	N/A	N/A
	South Korea	KEPCO	Flat	N/A	Seasonal ToUD	✓	✗	✓
	China		Flat	N/A	N/A	N/A	N/A	N/A

Source: Energeia Research; Note: 1. EV Incentives are comparing the EV Charging tariffs to the Alternative tariff (if unavailable, then the Default tariff); 2. Whether there is a discount to the energy rates; 3. Whether the tariff includes direct load control; 4. Whether there are differences in the structure of the tariffs

IBT = Inclining-Block Tariff, ToU = Time-of-Use, ToUD = Time-of-Use Demand

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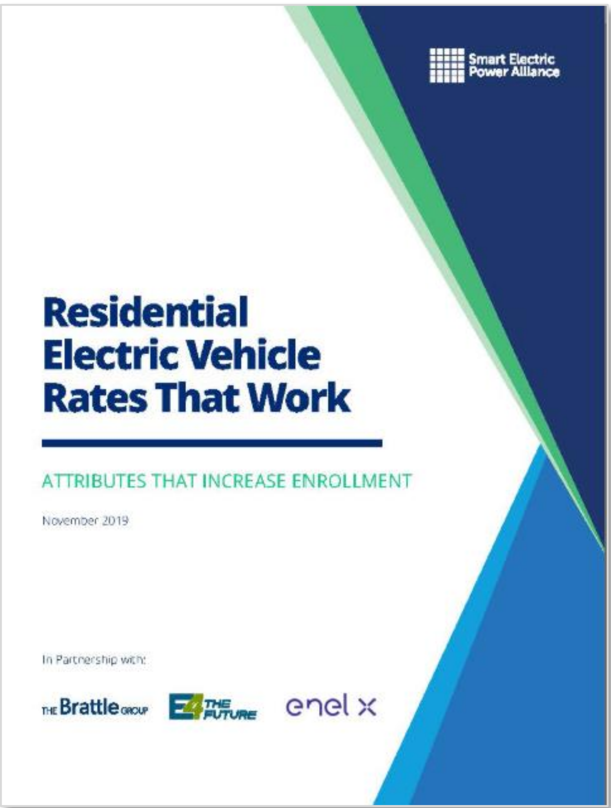
ToU EV rates are the most attractive to consumers

SEPA EV Rates Report



- The Brattle report complete for SEPA found that:
  - Customers on an EV-specific time-varying rate were more familiar with the rate rules and more likely to charge off-peak compared to their generic time-varying rate counterparts
  - Utility-driven initiatives had significantly higher average enrollment than mandated programs
  - Just offering a rate is not sufficient to attract customers; utilities that actively market residential EV rates had customer enrollment 1.4 times greater than those that were not marketed
  - 70% of the enrolled residential EV participants heard about their time-varying rate through least-cost marketing efforts
  - 72% of non-enrolled customers were willing and able to charge their EV during off-peak hours if the rate resulted in savings and was convenient to use

Source: SEPA (2019), 'Residential Electric Vehicle Rates That Work'

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Tariff Design Methodology and Inputs

Best Practice Tariff Design Methodology

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Tariff Design and Assessment Methodology

- Requirements
  - Rules compliant
  - Risk adjustment cost recovery
  - Economically sound (Ramsay, MC=MR, etc.)
- Design Parameters
  - Peak Period
  - LRMC
  - Residual Cost Recovery
  - Structure
- Design Assessment
  - Immediate bill impacts by segment
  - Economic incentives and cross-subsidies
  - Long-term bill impacts by segment

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Tariff Design Methodology and Inputs

Peak Period Setting

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Peak Period Setting

- Victorian ToU Periods
- Victorian DNSP Peak Analysis
  - Raw
  - P10
  - 3-Year Projected (P10)
  - 5-Year UED Deep Dive
- Victorian Regional Reference Price Analysis
- Recommended Network and Retail Peak Periods

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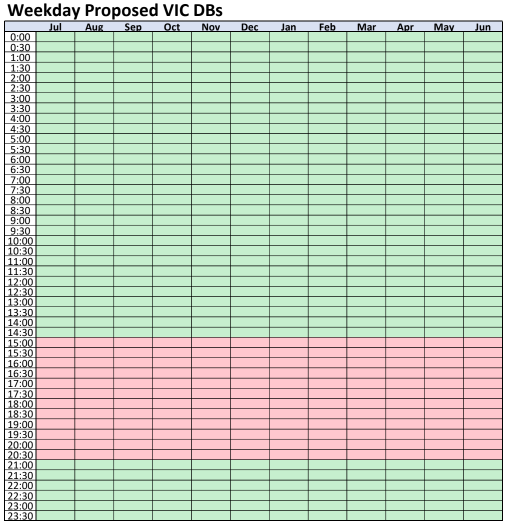
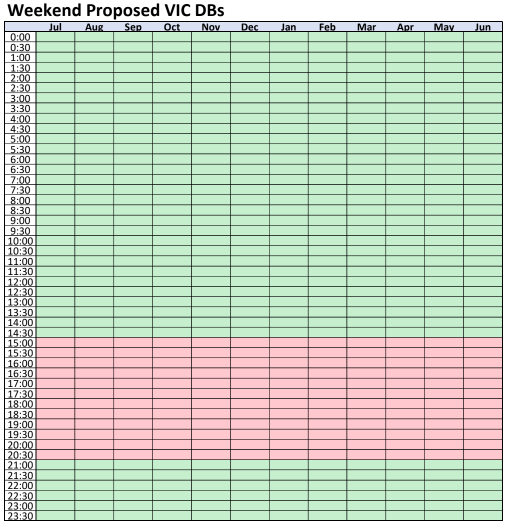
Current Victorian Peak Periods

Weekday Proposed VIC DBs



Weekend Proposed VIC DBs



- Current VIC-wide periods (heat map, using WE/WD, etc. format)
- Proposal for the 2021-2026 period is to extend the peak by 30 mins to 9pm
- Energeia's analysis shows that United consumers (for example) are currently being charged the wrong price 98% of the time
- Further, by 2026, our analysis shows consumers will be being charged the wrong peak price 99% of the time

Source: Victorian DNSPs, https://www.aer.gov.au/system/files/AER%20-%20Issues%20paper%20-%20Victorian%20Electricity%20Determination%202021-26%20-%20April%202020_2.pdf

DNSP Peak Periods (United) – Raw Peak

2018-19 Raw Weekday

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
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23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

2018-19 Raw Weekend

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
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21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Source: Energeia

- Energeia analysed zone substation data for each DNSP to identify:
  - Peak periods assuming >90% of annual peak
  - Impact of P10 weather normalisation
  - Impact of 5-year trending of P10 normalized load
- A 90% of peak period was selected as being the level of demand that could become the peak within 5 years
- P10 (1 in 10 year) weather was implemented as the industry standard for network and system planning
- Chart to the left shows UED's average peak load distribution using raw ZS load data
- The red box indicates the peak periods proposed by the Victorian DNSPs
- It can be seen that they are correct 8% of the time on weekdays, and 0% of the time on weekends

DNSP Peak Periods (United) – P10 Peak

2018-19 Raw Weekday

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	2%	2%	5%	5%	2%	2%	0%	2%	5%
8:00	2%	0%	0%	2%	2%	5%	10%	2%	2%	0%	2%	7%
8:30	5%	2%	2%	2%	2%	5%	14%	5%	2%	0%	2%	7%
9:00	5%	5%	2%	2%	2%	2%	24%	2%	2%	0%	2%	7%
9:30	5%	5%	2%	0%	2%	5%	36%	5%	2%	0%	7%	5%
10:00	5%	5%	2%	0%	5%	5%	48%	5%	5%	0%	5%	7%
10:30	5%	5%	2%	0%	2%	5%	60%	7%	2%	0%	5%	5%
11:00	5%	5%	2%	0%	5%	2%	69%	7%	2%	0%	5%	5%
11:30	5%	2%	2%	0%	0%	2%	62%	5%	2%	0%	5%	5%
12:00	2%	2%	2%	0%	2%	5%	55%	7%	2%	0%	2%	5%
12:30	2%	2%	0%	0%	2%	5%	67%	7%	2%	0%	2%	5%
13:00	2%	2%	0%	0%	2%	7%	62%	7%	5%	0%	0%	2%
13:30	2%	0%	0%	0%	0%	12%	31%	7%	5%	0%	2%	5%
14:00	2%	0%	2%	0%	0%	10%	31%	0%	5%	0%	0%	5%
14:30	2%	0%	0%	0%	0%	17%	19%	5%	7%	0%	0%	5%
15:00	0%	0%	0%	0%	0%	26%	19%	2%	21%	0%	0%	5%
15:30	0%	0%	0%	0%	0%	29%	26%	5%	48%	0%	0%	2%
16:00	0%	0%	0%	0%	0%	38%	33%	7%	64%	0%	0%	0%
16:30	0%	0%	0%	0%	0%	33%	43%	12%	62%	0%	0%	0%
17:00	0%	0%	0%	0%	0%	31%	57%	29%	57%	0%	0%	0%
17:30	0%	0%	0%	0%	0%	21%	57%	36%	57%	0%	0%	0%
18:00	0%	0%	0%	0%	0%	12%	60%	17%	50%	0%	0%	0%
18:30	2%	2%	0%	0%	0%	5%	57%	2%	29%	0%	2%	2%
19:00	2%	2%	0%	0%	0%	5%	40%	0%	10%	0%	2%	2%
19:30	2%	2%	0%	0%	0%	2%	31%	2%	2%	0%	2%	2%
20:00	2%	2%	0%	0%	0%	0%	24%	0%	0%	0%	2%	2%
20:30	2%	2%	0%	0%	0%	0%	7%	0%	0%	0%	2%	2%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

2018-19 P10 Weather Weekday

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:00	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	0%	0%
12:30	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	0%	0%
13:00	0%	0%	0%	0%	2%	0%	0%	24%	0%	0%	0%	0%
13:30	0%	0%	0%	0%	2%	0%	0%	24%	0%	0%	0%	0%
14:00	0%	0%	0%	0%	5%	5%	0%	21%	0%	0%	0%	0%
14:30	0%	0%	0%	0%	7%	5%	0%	24%	0%	0%	0%	0%
15:00	0%	0%	0%	0%	7%	14%	0%	52%	0%	0%	0%	0%
15:30	0%	0%	0%	0%	7%	24%	0%	90%	0%	0%	0%	0%
16:00	0%	0%	0%	0%	5%	26%	0%	98%	0%	0%	0%	0%
16:30	0%	0%	0%	0%	2%	21%	0%	98%	0%	0%	0%	0%
17:00	0%	0%	0%	0%	0%	26%	0%	98%	0%	0%	0%	0%
17:30	0%	0%	0%	0%	0%	19%	0%	95%	0%	0%	0%	0%
18:00	0%	0%	0%	0%	0%	14%	0%	95%	0%	0%	0%	0%
18:30	0%	0%	0%	0%	0%	10%	0%	88%	0%	0%	0%	0%
19:00	0%	0%	0%	0%	0%	2%	0%	33%	0%	0%	0%	0%
19:30	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%
20:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
20:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

2018-19 Raw Weekend

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:30	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:00	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:30	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
14:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
14:30	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%
15:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
15:30	0%	0%	0%	0%	0%	0%	0%	7%	5%	0%	0%	0%
16:00	0%	0%	0%	0%	0%	0%	0%	7%	12%	0%	0%	0%
16:30	0%	0%	0%	0%	0%	0%	0%	7%	19%	0%	0%	0%
17:00	0%	0%	0%	0%	0%	0%	0%	7%	29%	0%	0%	0%
17:30	0%	0%	0%	0%	0%	0%	0%	5%	26%	0%	0%	0%
18:00	0%	0%	0%	0%	0%	0%	0%	0%	21%	0%	0%	2%
18:30	2%	2%	0%	0%	0%	0%	0%	0%	7%	0%	0%	2%
19:00	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
19:30	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
20:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
20:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

2018-19 P10 Weather Weekend

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
14:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
14:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
15:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
15:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
16:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
16:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
17:00	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%
17:30	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%
18:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
18:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
19:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
19:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
20:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
20:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Source: Energeia

- Chart to the left shows UED’s average loads using raw and P10 load data
- The proposed periods are correct 6% of the time on weekdays, and 0% of the time on weekends for P10 normalised temperatures

DNSP Peak Periods (United) – 3-Year Trend (P10)

2018-19 Raw Weekday

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	2%	2%	5%	5%	2%	2%	0%	2%	5%
8:00	2%	0%	0%	2%	2%	5%	10%	2%	2%	0%	2%	7%
8:30	5%	2%	2%	2%	2%	5%	14%	5%	2%	0%	2%	7%
9:00	5%	5%	2%	2%	2%	2%	24%	2%	2%	0%	2%	7%
9:30	5%	5%	2%	0%	2%	5%	36%	5%	2%	0%	7%	5%
10:00	5%	5%	2%	0%	5%	5%	48%	5%	5%	0%	5%	7%
10:30	5%	5%	2%	0%	2%	5%	60%	7%	2%	0%	5%	5%
11:00	5%	5%	2%	0%	5%	2%	69%	7%	2%	0%	5%	5%
11:30	5%	2%	2%	0%	0%	2%	62%	5%	2%	0%	5%	5%
12:00	2%	2%	2%	0%	2%	5%	55%	7%	2%	0%	2%	5%
12:30	2%	2%	0%	0%	2%	5%	67%	7%	2%	0%	2%	5%
13:00	2%	2%	0%	0%	2%	7%	62%	7%	5%	0%	0%	2%
13:30	2%	0%	0%	0%	0%	12%	31%	7%	5%	0%	2%	5%
14:00	2%	0%	2%	0%	0%	10%	31%	0%	5%	0%	0%	5%
14:30	2%	0%	0%	0%	0%	17%	19%	5%	7%	0%	0%	5%
15:00	0%	0%	0%	0%	0%	26%	19%	2%	21%	0%	0%	5%
15:30	0%	0%	0%	0%	0%	29%	26%	5%	48%	0%	0%	2%
16:00	0%	0%	0%	0%	0%	38%	33%	7%	64%	0%	0%	0%
16:30	0%	0%	0%	0%	0%	33%	43%	12%	62%	0%	0%	0%
17:00	0%	0%	0%	0%	0%	31%	57%	29%	57%	0%	0%	0%
17:30	0%	0%	0%	0%	0%	21%	57%	36%	57%	0%	0%	0%
18:00	0%	0%	0%	0%	0%	12%	60%	17%	50%	0%	0%	0%
18:30	2%	2%	0%	0%	0%	5%	57%	2%	29%	0%	2%	2%
19:00	2%	2%	0%	0%	0%	5%	40%	0%	10%	0%	2%	2%
19:30	2%	2%	0%	0%	0%	2%	31%	2%	2%	0%	2%	2%
20:00	2%	2%	0%	0%	0%	0%	24%	0%	0%	0%	2%	2%
20:30	2%	2%	0%	0%	0%	0%	7%	0%	0%	0%	2%	2%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

2018-19 P10 Weather Weekday

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:00	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	0%	0%
12:30	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	0%	0%
13:00	0%	0%	0%	0%	2%	0%	0%	24%	0%	0%	0%	0%
13:30	0%	0%	0%	0%	2%	0%	0%	24%	0%	0%	0%	0%
14:00	0%	0%	0%	0%	5%	5%	0%	21%	0%	0%	0%	0%
14:30	0%	0%	0%	0%	7%	5%	0%	24%	0%	0%	0%	0%
15:00	0%	0%	0%	0%	7%	14%	0%	52%	0%	0%	0%	0%
15:30	0%	0%	0%	0%	7%	24%	0%	90%	0%	0%	0%	0%
16:00	0%	0%	0%	0%	5%	26%	0%	98%	0%	0%	0%	0%
16:30	0%	0%	0%	0%	2%	21%	0%	98%	0%	0%	0%	0%
17:00	0%	0%	0%	0%	0%	26%	0%	98%	0%	0%	0%	0%
17:30	0%	0%	0%	0%	0%	19%	0%	95%	0%	0%	0%	0%
18:00	0%	0%	0%	0%	0%	14%	0%	95%	0%	0%	0%	0%
18:30	0%	0%	0%	0%	0%	10%	0%	88%	0%	0%	0%	0%
19:00	0%	0%	0%	0%	0%	2%	0%	33%	0%	0%	0%	0%
19:30	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%
20:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
20:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

United CAGR P10 Weekday

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:00	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
10:30	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
11:00	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
11:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:30	0%	0%	0%	0%	2%	0%	2%	2%	0%	0%	0%	0%
13:00	0%	0%	0%	0%	2%	2%	7%	7%	0%	0%	0%	0%
13:30	0%	0%	0%	0%	10%	5%	10%	7%	0%	0%	0%	0%
14:00	0%	0%	0%	0%	10%	2%	2%	2%	0%	0%	0%	0%
14:30	0%	0%	0%	0%	12%	5%	0%	5%	0%	0%	0%	0%
15:00	0%	0%	0%	0%	12%	26%	0%	10%	0%	0%	0%	0%
15:30	0%	0%	0%	0%	10%	31%	0%	17%	0%	0%	0%	0%
16:00	0%	0%	0%	0%	10%	52%	0%	19%	0%	0%	0%	0%
16:30	0%	0%	0%	0%	12%	57%	0%	17%	0%	0%	0%	0%
17:00	0%	0%	0%	0%	5%	57%	0%	24%	0%	0%	0%	0%
17:30	0%	0%	0%	0%	0%	36%	0%	19%	0%	0%	0%	0%
18:00	0%	0%	0%	0%	0%	31%	5%	10%	0%	0%	0%	0%
18:30	0%	0%	0%	0%	0%	10%	10%	14%	0%	0%	0%	0%
19:00	0%	0%	0%	0%	0%	5%	12%	5%	0%	0%	0%	0%
19:30	0%	0%	0%	0%	0%	2%	10%	2%	0%	0%	0%	0%
20:00	0%	0%	0%	0%	0%	0%	10%	0%	0%	0%	0%	0%
20:30	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

2018-19 Raw Weekend

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:30	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:00	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:30	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
14:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
14:30	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%
15:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
15:30	0%	0%	0%	0%	0%	0%	0%	7%	5%	0%	0%	0%
16:00	0%	0%	0%	0%	0%	0%	0%	7%	12%	0%	0%	0%
16:30	0%	0%	0%	0%	0%	0%	0%	7%	19%	0%	0%	0%
17:00	0%	0%	0%	0%	0%	0%	0%	7%	29%	0%	0%	0%
17:30	0%	0%	0%	0%	0%	0%	0%	5%	26%	0%	0%	0%
18:00	0%	0%	0%	0%	0%	0%	0%	0%	21%	0%	0%	2%
18:30	2%	2%	0%	0%	0%	0%	0%	0%	7%	0%	0%	2%
19:00	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
19:30	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
20:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
20:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

2018-19 P10 Weather Weekend

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
14:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
14:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
15:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
15:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
16:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
16:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
17:00	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%
17:30	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%
18:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
18:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
19:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
19:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
20:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
20:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

United CAGR P10 Weekend

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13:00	0%	0%	0%	0%	0%	2%	0%	2%	0%	0%	0%	0%
13:30	0%	0%	0%	0%	0%	0%	2%	2%	0%	0%	0%	0%
14:00	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
14:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
15:00	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
15:30	0%	0%	0%	0%	0%	0%	2%	2%	0%	0%	0%	0%
16:00	0%	0%	0%	0%	0%	0%	2%	5%	0%	0%	0%	0%
16:30	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%
17:00	0%	0%	0%	0%	0%	0%	0%	7%	2%	0%	0%	0%
17:30	0%	0%	0%	0%	0%	0%	0%	0%	10%	0%	0%	0%
18:00	0%	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	0%
18:30	0%	0%	0%	0%	0%	2%	0%	7%	7%	0%	0%	0%
19:00	0%	0%	0%	0%	0%	2%	0%	2%	5%	0%	0%	0%
19:30	0%	0%	0%	0%	0%	2%	0%	5%	5%	0%	0%	0%
20:00	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%
20:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Source: Energeia

- Chart to the left shows UED's substation weighted average loads using raw, P10 and trended load data
- Trending of last 3 years of ZS data adjusted for P10 weather is used to identify the future peak
- Trending reveals the need to include Dec, Jan and potentially weekend days in the peak period
- Using the technically correct approach shows consumers should benefit from off-peak prices for 99% longer than proposed
- *Energeia recommends red boxed peak periods in the CAGR P10 tables*

Generation, Network (United) and Retail Peak Periods

United CAGR P10 Weekday

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:00	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
10:30	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
11:00	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
11:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:30	0%	0%	0%	0%	2%	0%	2%	2%	0%	0%	0%	0%
13:00	0%	0%	0%	0%	2%	2%	7%	7%	0%	0%	0%	0%
13:30	0%	0%	0%	0%	2%	5%	10%	7%	0%	0%	0%	0%
14:00	0%	0%	0%	0%	10%	2%	2%	2%	0%	0%	0%	0%
14:30	0%	0%	0%	0%	12%	5%	0%	5%	0%	0%	0%	0%
15:00	0%	0%	0%	0%	12%	26%	0%	10%	0%	0%	0%	0%
15:30	0%	0%	0%	0%	10%	31%	0%	17%	0%	0%	0%	0%
16:00	0%	0%	0%	0%	10%	52%	0%	19%	0%	0%	0%	0%
16:30	0%	0%	0%	0%	12%	57%	0%	17%	0%	0%	0%	0%
17:00	0%	0%	0%	0%	5%	57%	0%	24%	0%	0%	0%	0%
17:30	0%	0%	0%	0%	0%	36%	0%	19%	0%	0%	0%	0%
18:00	0%	0%	0%	0%	0%	31%	5%	10%	0%	0%	0%	0%
18:30	0%	0%	0%	0%	0%	10%	10%	14%	0%	0%	0%	0%
19:00	0%	0%	0%	0%	0%	5%	12%	5%	0%	0%	0%	0%
19:30	0%	0%	0%	0%	0%	2%	10%	2%	0%	0%	0%	0%
20:00	0%	0%	0%	0%	0%	0%	10%	0%	0%	0%	0%	0%
20:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Generation CAGR P10 Weekday

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	48%	41%	45%	47%	31%	45%	54%	38%	59%	39%	46%	49%
0:30	41%	41%	43%	46%	31%	40%	50%	36%	55%	40%	44%	47%
1:00	40%	40%	41%	44%	36%	38%	49%	35%	53%	39%	41%	46%
1:30	39%	41%	40%	43%	30%	36%	50%	34%	48%	37%	41%	45%
2:00	37%	40%	39%	41%	30%	36%	47%	33%	46%	36%	40%	46%
2:30	39%	38%	40%	39%	30%	38%	46%	32%	46%	35%	38%	45%
3:00	35%	38%	39%	37%	29%	38%	46%	31%	46%	34%	38%	46%
3:30	35%	39%	38%	37%	30%	37%	49%	32%	47%	37%	36%	44%
4:00	35%	40%	39%	37%	30%	35%	54%	33%	48%	37%	36%	43%
4:30	37%	41%	39%	39%	38%	36%	56%	34%	48%	40%	38%	43%
5:00	38%	42%	40%	41%	39%	36%	60%	34%	48%	46%	44%	44%
5:30	39%	43%	41%	45%	39%	35%	65%	36%	49%	55%	39%	47%
6:00	42%	46%	44%	47%	37%	35%	71%	40%	49%	64%	44%	50%
6:30	47%	51%	48%	51%	39%	36%	79%	41%	52%	70%	47%	57%
7:00	53%	54%	52%	52%	41%	35%	83%	41%	53%	69%	47%	61%
7:30	55%	56%	56%	51%	38%	32%	88%	40%	52%	59%	52%	64%
8:00	57%	54%	55%	46%	38%	31%	92%	39%	53%	53%	54%	67%
8:30	55%	50%	51%	44%	39%	31%	91%	37%	59%	50%	56%	71%
9:00	54%	48%	46%	44%	38%	34%	92%	37%	61%	46%	54%	70%
9:30	52%	47%	45%	43%	39%	38%	90%	36%	67%	45%	53%	67%
10:00	48%	46%	42%	42%	42%	42%	88%	36%	72%	44%	52%	65%
10:30	46%	44%	39%	42%	45%	46%	86%	35%	45%	38%	53%	60%
11:00	46%	42%	37%	43%	38%	48%	83%	35%	47%	44%	54%	57%
11:30	44%	40%	36%	42%	39%	49%	81%	36%	49%	43%	52%	55%
12:00	43%	39%	36%	36%	40%	50%	85%	37%	51%	42%	54%	54%
12:30	41%	39%	34%	38%	42%	51%	86%	39%	54%	42%	53%	54%
13:00	41%	37%	31%	39%	42%	53%	85%	41%	59%	45%	54%	53%
13:30	40%	38%	31%	40%	42%	55%	82%	44%	62%	47%	50%	54%
14:00	40%	40%	30%	40%	43%	57%	81%	50%	65%	48%	50%	52%
14:30	39%	41%	31%	42%	44%	59%	82%	54%	67%	49%	50%	53%
15:00	40%	42%	32%	44%	44%	63%	84%	78%	72%	48%	48%	53%
15:30	41%	42%	33%	48%	46%	63%	84%	86%	74%	49%	47%	53%
16:00	48%	43%	33%	49%	45%	65%	86%	85%	79%	50%	50%	53%
16:30	52%	42%	35%	51%	47%	67%	87%	84%	78%	53%	55%	56%
17:00	55%	42%	37%	56%	49%	72%	89%	82%	78%	53%	53%	58%
17:30	54%	42%	40%	56%	49%	74%	95%	81%	77%	53%	50%	61%
18:00	58%	53%	42%	60%	49%	73%	98%	80%	77%	56%	52%	63%
18:30	60%	56%	44%	60%	47%	71%	98%	78%	77%	57%	60%	64%
19:00	60%	55%	46%	58%	44%	66%	94%	77%	74%	57%	61%	66%
19:30	58%	55%	46%	59%	44%	67%	94%	78%	71%	55%	61%	65%
20:00	58%	53%	47%	59%	43%	66%	98%	73%	71%	54%	60%	67%
20:30	55%	52%	52%	56%	41%	64%	100%	67%	67%	53%	60%	63%
21:00	54%	51%	51%	52%	38%	64%	95%	64%	66%	50%	58%	63%
21:30	53%	52%	49%	51%	39%	64%	90%	62%	64%	49%	56%	61%
22:00	50%	52%	49%	50%	37%	60%	86%	59%	60%	49%	54%	59%
22:30	48%	51%	46%	48%	36%	58%	76%	55%	55%	46%	50%	53%
23:00	45%	50%	44%	44%	33%	54%	72%	52%	52%	44%	47%	49%
23:30	45%	50%	43%	43%	33%	50%	69%	53%	49%	44%	44%	47%

Retail CAGR P10 Weekday

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0	0	0	0	0	0	0	0	0	0	0	0
0:30	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0
1:30	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0
2:30	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0
4:30	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0	0	0	0
5:30	0	0	0	0	0	0	0	0	0	0	0	0
6:00	0	0	0	0	0	0	0	0	0	0	0	0
6:30	0	0	0	0	0	0	0	0	0	0	0	0
7:00	0	0	0	0	0	0	0	0	0	0	0	0
7:30	0	0	0	0	0	0	0	0	0	0	0	0
8:00	0	0	0	0	0	0	1	0	0	0	0	0
8:30	0	0	0	0	0	0	1	0	0	0	0	0
9:00	0	0	0	0	0	0	1	0	0	0	0	0
9:30	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	1	0	0	0	0	0	0
16:30	0	0	0	0	0	1	0	0	0	0	0	0
17:00	0	0	0	0	0	1	0	0	0	0	0	0
17:30	0	0	0	0	0	0	1	0	0	0	0	0
18:00	0	0	0	0	0	0	1	0	0	0	0	0
18:30	0	0	0	0	0	0	1	0	0	0	0	0
19:00	0	0	0	0	0	0	1	0	0	0	0	0
19:30	0	0	0	0	0	0	1	0	0	0	0	0
20:00	0	0	0	0	0	0	1	0	0	0	0	0
20:30	0	0	0	0	0	0	1	0	0	0	0	0
21:00	0	0	0	0	0	0	1	0	0	0	0	0
21:30	0	0	0	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0	0	0	0
22:30	0	0	0	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0	0	0	0
23:30	0	0	0	0	0	0	0	0	0	0	0	0

United CAGR P10 Weekend

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13:00	0%	0%	0%	0%	0%	2%	0%	2%	0%	0%	0%	0%
13:30	0%	0%	0%	0%	0%	0%	2%	2%	0%	0%	0%	0%
14:00	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
14:30	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
15:00	0%	0%	0%	0%	0%	0%	2%	2%	0%	0%	0%	0%
15:30	0%	0%	0%	0%	0%	0%	2%	2%	0%	0%	0%	0%
16:00	0%	0%	0%	0%	0%	0%	2%	5%	0%	0%	0%	0%
16:30	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%
17:00	0%	0%	0%	0%	0%	0%	0%	7%	2%	0%	0%	0%
17:30	0%	0%	0%	0%	0%	0%	0%	0%	10%	0%	0%	0%
18:00	0%	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	0%
18:30	0%	0%	0%	0%	0%	2%	0%	7%	7%	0%	0%	0%
19:00	0%	0%	0%	0%	0%	2%	0%	2%	5%	0%	0%	0%
19:30	0%	0%	0%	0%	0%	2%	0%	5%	5%	0%	0%	0%
20:00	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%
20:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Generation CAGR P10 Weekend

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	41%	52%	36%	51%	38%	68%	36%	36%	63%	36%	49%	50%
0:30	38%	45%	34%	50%	35%	62%	33%	35%	58%	34%	47%	50%
1:00	37%	43%	33%	46%	34%	59%	32%	35%	57%	36%	46%	49%
1:30	36%	36%	33%	46%	34%	55%	34%	42%	56%	36%	45%	50%
2:00	35%	33%	32%	44%	33%	51%	35%	40%	53%	36%	44%	50%
2:30	34%	32%	31%	42%	32%	49%	32%	38%	49%	38%	41%	48%
3:00	33%	32%	32%	40%	33%	45%	33%	37%	49%	37%	41%	45%
3:30	32%	30%	32%	39%	33%	42%	33%	37%	45%	38%	40%	45%
4:00	33%	32%	30%	40%	33%	41%	34%	35%	45%	37%	40%	45%
4:30	33%	32%	30%	37%	32%	41%	35%	34%	45%	37%	40%	45%
5:00	34%	31%	30%	38%	34%	40%	34%	33%	45%	38%	41%	44%
5:30	34%	32%	31%	39%	35%	38%	35%	32%	45%	32%	42%	44%
6:00	35%	32%	32%	40%	36%	37%	35%	32%	47%	34%	42%	44%
6:30	37%	36%	32%	42%	39%	36%	36%	34%	46%	34%	49%	45%
7:00	36%	38%	34%	42%	39%	35%	35%	35%	49%	34%	46%	46%
7:30	36%	38%	35%	40%	39%	34%	35%	34%	51%	37%	49%	48%
8:00	36%	40%	34%	37%	36%	35%	35%	38%	54%	37%	52%	49%
8:30	37%	39%	37%	37%	32%	38%	35%	38%	56%	37%	52%	53%
9:00	40%	42%	38%	36%	31%	39%	32%	38%	59%	36%	51%	54%
9:30	40%	42%	32%	36%	31%	41%	30%	41%	63%	37%	47%	57%
10:00	42%	53%	29%	35%	28%	40%	31%	44%	68%	41%	43%	57%
10:30	43%	52%	28%	31%	29%	41%	31%	45%	73%	40%	45%	56%
11:00	41%	49%	27%	33%	29%	40%	30%	47%	54%	39%	45%	55%
11:30	42%	46%	27%	34%	28%	40%	30%	50%	55%	39%	44%	56%
12:00	44%	49%	29%	34%	28%	42%	31%	53%	56%	36%	44%	55%
12:30	44%	49%	28%	37%	28%	39%	31%	55%	58%	34%	45%	55%
13:00	43%	48%	28%	45%	27%	42%	32%	59%	61%	33%	43%	54%
13:30	43%	48%	33%	48%	26%	45%	32%	65%	64%	33%	43%	55%
14:00	43%	47%	38%	47%	62%	50%	33%	66%	68%	34%	42%	56%
14:30	43%	44%	41%	45%	62%	52%	34%	83%	73%	34%	38%	54%
15:00	45%	47%	44%	44%	63%	55%	34%	62%	76%	34%	38%	55%
15:30	47%	48%	48%	43%	63%	58%	35%	63%	79%	33%	41%	55%
16:00	49%	48%	46%	45%	63%	59%	36%	67%	83%	34%	43%	55%
16:30	53%	54%	49%	47%	65%	59%	37%	69%	86%	39%	45%	56%
17:00	56%	54%	47%	49%	66%	59%	40%	71%	88%	40%	46%	57%
17:30	55%	57%	50%	48%	66%	60%	41%	74%	90%	42%	42%	60%
18:00	55%	42%	45%	48%	65%	62%	44%	76%	93%	44%	43%	66%
18:30	54%	44%	44%	48%	63%	62%	45%	79%	96%	46%	42%	70%
19:00	54%	43%	43%	47%	62%	61%	46%	81%	95%	46%	42%	72%
19:30	52%	41%	52%	47%	58%	59%	44%	79%	92%	45%	42%	74%
20:00	50%	39%	51%	44%	56%	56%	44%	74%	90%	44%	40%	73%
20:30	50%	39%	51%	44%	53%	55%	42%	78%	87%	43%	40%	70%
21:00	48%	38%	49%	43%	50%	52%	40%	76%	80%	42%	38%	69%
21:30	48%	37%	47%	42%	34%	47%	39%	72%	77%	44%	38%	64%
22:00	47%	37%	44%	42%	32%	43%	37%	68%	73%	43%	40%	62%
22:30	45%	34%	41%	42%	32%	40%	33%	64%	66%	40%	40%	58%
23:00	43%	33%	37%	41%	32%	39%	32%	56%	61%	37%	42%	57%
23:30	43%	39%	38%	40%	34%	41%	32%	54%	60%	36%	41%	54%

Retail CAGR P10 Weekend

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0	0	0	0	0	0	0	0	0	0	0	0
0:30	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0
1:30	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0
2:30	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0
4:30	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0	0	0	0
5:30	0	0	0	0	0	0	0	0	0	0	0	0
6:00	0	0	0	0	0	0	0	0	0	0	0	0
6:30	0	0	0	0	0	0	0	0	0	0	0	0
7:00	0	0	0	0	0	0	0	0	0	0	0	0
7:30	0	0	0	0	0	0	0	0	0	0	0	0
8:00	0	0	0	0	0	0	0	0	0	0	0	0
8:30	0	0	0	0	0	0	0	0	0	0	0	0
9:00	0	0	0	0	0	0	0	0	0	0	0	0
9:30	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	1	0	0	0
18:30	0	0	0	0	0	0	0	0	1	0	0	0
19:00	0	0	0	0	0	0	0	0	1	0	0	0
19:30	0	0	0	0	0	0	0	0	1	0	0	0
20:00	0	0	0	0	0	0	0	0	0	0	0	0
20:30	0	0	0	0	0	0	0	0	0	0	0	0
21:00	0	0	0	0	0	0	0	0	0	0	0	0
21:30	0	0	0	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0	0	0	0
22:30	0	0	0	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0	0	0	0
23:30	0	0	0	0	0	0	0	0	0	0	0	0

- Charts show the network, generation and combination (retail) period definitions
- The generation peak was based on VIC NEM demand data from AEMO
- The retail peak periods combine the network and generation peak periods
- *Energeia recommends the retail peak periods as the most cost reflective*

Source: Energeia

Tariff Design Methodology and Inputs

LRMC Determination

ENERGEIA

Determining Long-Run-Marginal-Cost (LRMC)

- Victorian DSNP LRMCs
- Victorian LRMC Methodologies
- Avoidable Costs
- Energeia's LRMC Analysis

Victorian Calculation Methods, Assumptions and Results

Victorian DNSP Low-Voltage LRMC's

Low Voltage Long Run Marginal Cost		
	Annual Pricing Proposals or Tariff Structure Statements ($ / kVA / year)	Reg Proposal Model ($ / kVA / year)
AusNet	$88.70 (2019)	$62.57 (2019)
CitiPower	$94.22 (2015)	$94.22 (2015)
Powercor	$96.64 (2015)	$96.64 (2015)
United Energy	$124.00 (2015)	N/A
Jemena	$60.03 (2019)	$80.67 (2019)

Source: DNSP LRMC Models and Annual Pricing Proposals

LRMC Calculation Methodologies and Key Assumptions

		AusNet	Jemena	CitiPower / Powercor	United
Demand	Main Forecast Method	P50 Non-Coincident at ZS level	Raw Non-Coincident at customer level	Raw Non-Coincident at ZS level	
Demand	Split by Voltage Level?	×	✓	×	
Capex	Repex	×	×	×	
Capex	Augex	10%, Annualised by Project Cashflow Timing	90%, Annualised by Asset Life	×[1]	
Capex	Connex	×	65% SCS Connex	×	
Capex	Opex %	1%	4.3%	0.5%	
LRMC	Diversity Factor	×	×	✓	
LRMC	Start Year	FY19	FY19	CY16	
LRMC	Time Horizon	10	10	10	

Source: DNSP LRMC Models and RINs, Energeia, Note: 1. Annualised by Project Cashflow Timing, but annualised costs not disclosed to enable back calculation of Augex

- Victorian DNSPs, like their peers, determine LRMC using key assumptions about which costs to include
- A fraction of total planned expenditure is generally deemed avoidable
- This results in LRMCs that are relatively low, with relatively high and unavoidable sunk costs
- Energeia therefore examined the case for including additional costs and the impact on estimated LRMC
- This issue is topical for a number of reasons, including the AER's decision to make repex subject to the RIT-D

SAPN Avoidable Repex for LRMC Case Study

SAPN Repex Exclusions for LRMC

Asset Replace/Refurbish	Sub-Trans	Zone S/Stn	HV Feeder	Dist T/F	LV Feeder	Not Aug
Lines						
Planned						
Cable Replacement - Planned			15%		10%	75%
Conductor Replacement - Planned			15%		10%	75%
Line Ancillary Equipment - Planned (incl LFIs, fences, gates, signs etc)						100%
Line Regulation - Planned (incl regulators, capacitors)						100%
Overhead Line Components - Planned (incl insulators, crossarms, taps, pole earths)						100%
Poles - Planned						100%
Recloser Refurbishment - Planned						100%
Recloser Replacement - Planned						100%
Services Replacement - Planned					15%	85%
Strategic Line Maintenance Spares						100%
Switchgear - Ground Level - Planned						100%
Switchgear - Overhead - Planned						100%
Transformers - Planned				25%		75%
Poles - Planned plating						100%
Recloser Maintenance - Planned						100%
Pole Replacement Projects						100%
CBD ducts & manholes						100%
Cables - CBD 11kV PILC cable replacements						100%
Services - Aluminium neutral screen service line replacements						100%
Unplanned						
Cable Replacement - Unplanned			15%		10%	75%
Line Ancillary Equipment - Unplanned (incl LFIs, fences, gates, signs etc)						100%
Line Regulation - Unplanned (incl regulators, capacitors)						100%
Overhead Line Components - Unplanned (incl insulators, Xarms, pole earths)						100%
Poles - Unplanned						100%
Recloser Replacement - Unplanned						100%
Services Replacement - Unplanned					15%	85%
Switchgear - Ground Level - Unplanned						100%
Switchgear - Overhead - Unplanned						100%
Transformers - Unplanned				25%		75%
Other						100%
Substations						
Auxillary DC Supplies excl AC - Battery Banks & Chargers						100%
Capacitor Banks - CAPACITY UPGRADE?						100%
Circuit Breakers Planned Replacement		10%				90%
Circuit Breakers Planned Refurb		25%				75%
Mobile Substations		25%				75%
Protection Relays (Replace 33kV/66kV Fuses, incl Fault Thrower)						100%
Substation Insurance Spares & Asset Mgt						100%
Substation Infrastructure - Civil (incl buildings, structures)						100%
Substation Transformer Repl.		25%				75%
TF Refurb (18665 & 18977)						100%
Planned Transformer Refurbishment - also done under 18665						100%
Surge Arrester						100%
Carryover (subs)						100%
AC Panels + auxilary supply						100%
Protection Asset Replacement						100%
Unplanned CB Replacement		25%				75%
Standby Power Station						100%
Unplanned Substation Asset Repl - PROTECTION						100%
Other (sub cables)						100%
Northfield 66kV GIS Switchboard replacement (1/3rd)		25%				75%
MOD3C Substation Upgrades (trf to 18665)						100%
Substation Standards Templates and CU Developments						100%
Relay Replace on Failure						100%
Cable replacement & Cable Termination Support upgrade (tfr to other)						100%
GIS Assessment and Refurbishment						100%
Transformer planned replacement due to condition						100%

Source: SAPN Reg Proposal 2021-26, Energeia

- The table to the left reports on SAPN's assumed level of avoidable repex in their LRMC analysis
- This results in around 5% of the total forecast repex spend being included in the LRMC calculation
- An alternative view of assets is that most high voltage feeders and zone substations could be removed if load was expected to be reduced for foreseeable future
- This would make repex, and potentially connex and cap cons also 100% variable, or at least some portion of it – a future vision or reference design is needed

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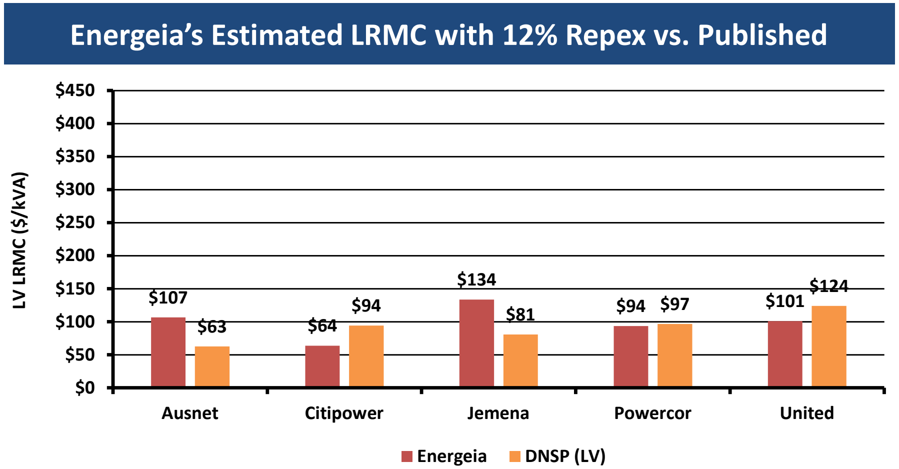
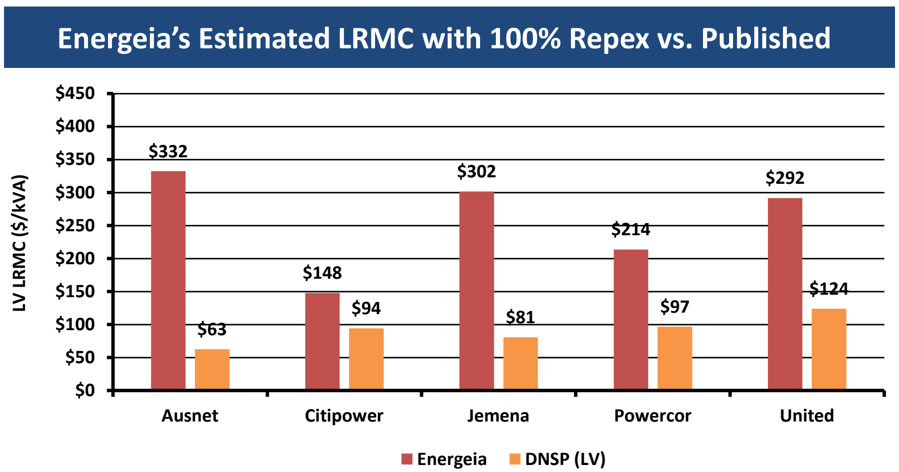
Energeia's Estimated LRMCs vs. Published



Source: Energeia, DNSP Tariff Structure Statements, Note: Connex excluded, avoidable Repex assumed to be 12%

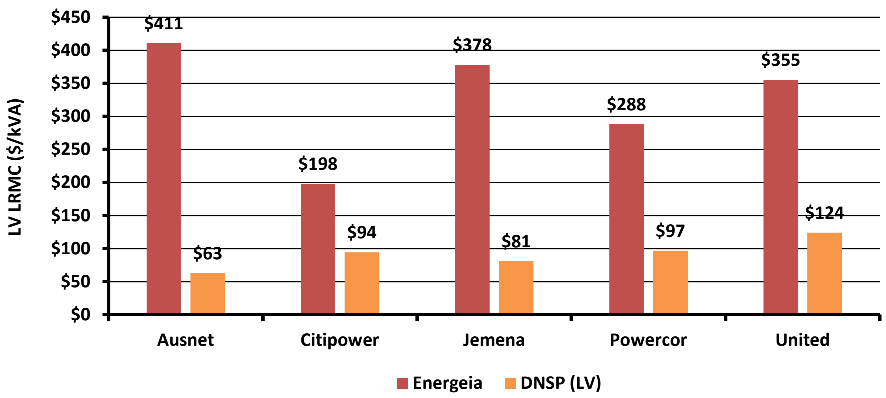


Source: Energeia, DNSP Tariff Structure Statements, Note: Connex excluded, avoidable Repex assumed to be 100%

- Energeia developed a tool for calculating LRMC, which is similar in operation and input to DNSP tools
  - It also draws from RIN data
  - It can be parameterized to generate the same results with the same settings as the DNSPs
- The top left graphic shows our bottom-up estimates compared to the DNSP reported LRMCs
- The bottom left graphic shows our revised estimate if we include the bookend scenario, all repex, etc.
- The following slide shows some intermediate settings, which we are recommending to take forward

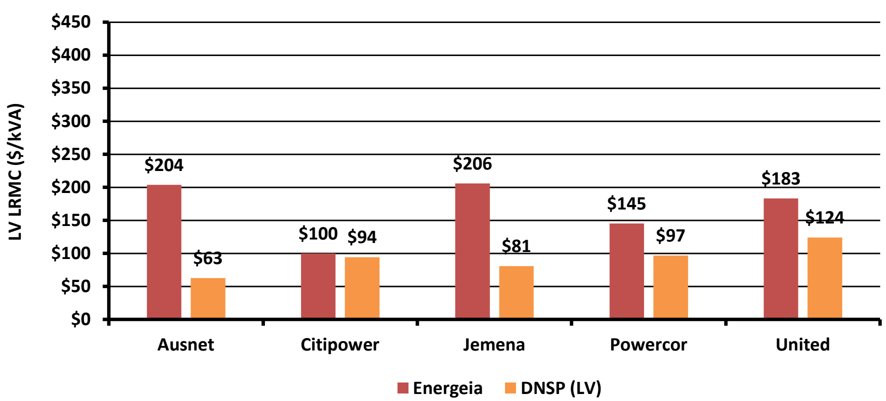
Energeia's Recommended LRMCs

Energeia's Estimated LRMC with 100% Repex + Connex



Source: Energeia, DNSP Tariff Structure Statements, Note: Connex included, avoidable, Repex assumed to be 100%

Energeia's Estimated LRMC with 50% Repex



Source: Energeia, DNSP Tariff Structure Statements, Note: Connex excluded, avoidable Repex assumed to be 50%

- The graphic to the top left assumes 100% repex and 100% cap cons and connex
  - This implies distributed energy being able to replace 100% of the high voltage and sub-transmission network
- The graphic on the bottom left assumes 50% repex is avoidable
  - *Energeia recommends taking the 50% repex assumption forward into the rate design step*
  - *This assumes that the absence of load could enable removal of assets*

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Pricing Design and impact Assessment

Structure, Periods and Prices

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Determining Tariff Structure and Residual Cost Allocation

- Peak pricing components
  - Distribution peak
  - Generation peak

- Residual cost components
  - Sliding scale fixed based on class outcomes not individual outcomes (non-distortionary)
  - Retail overhead considerations

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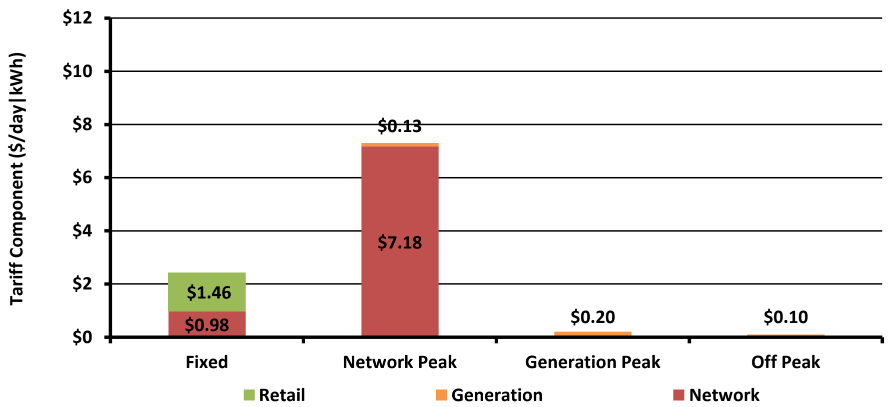
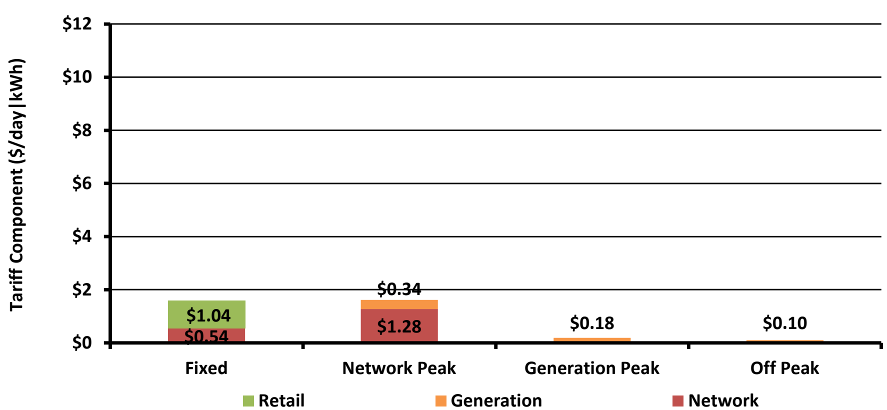
Tariff Rate Breakdown (1/2)

AusNet



Source: Energeia

CitiPower



Source: Energeia

- Daily fixed charges used to recover all residual costs
  - Retail margin treated as a residual cost
- Two peak periods defined to recover peak costs
  - Generation based on observed NEM demand data from the past 3 years
  - Pricing level mostly a function of hours
- *Remember, these are voluntary tariffs, and will only be adopted if consumers or their agents think better off*
  - *They are designed to enable more efficient grid usage, and that includes increasing the addressable benefits for demand response*

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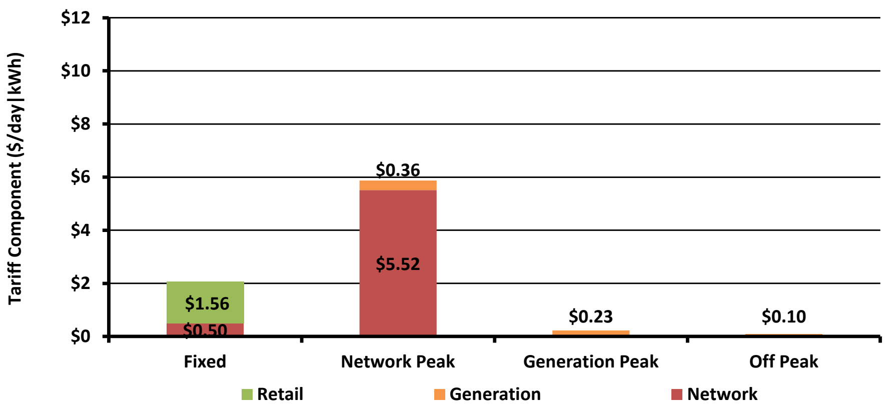
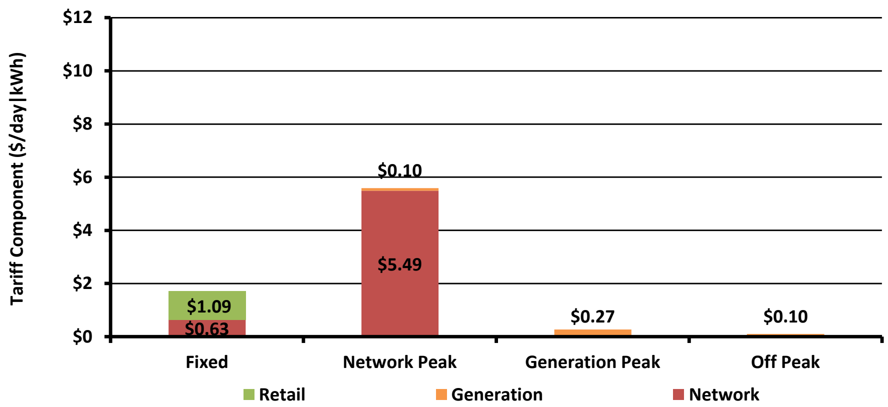
Tariff Rate Breakdown (2/2)

Jemena



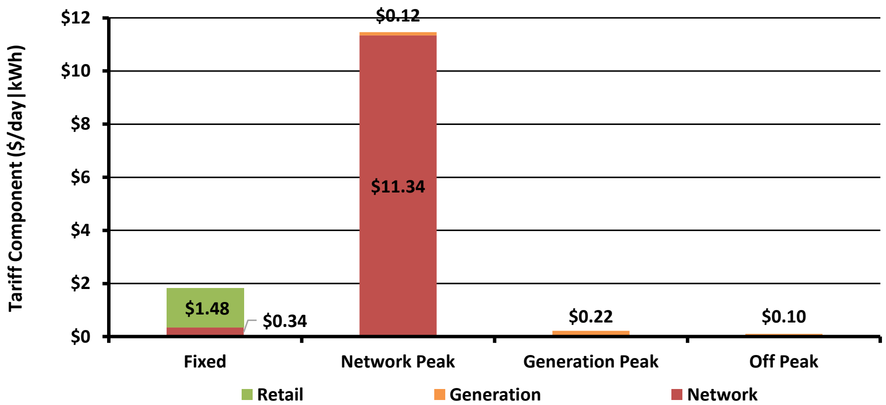
Source: Energeia

Powercor



Source: Energeia

United



Source: Energeia

- JEN, PCR and ASN peak prices are in the $5-8/kWh range
- UED is $12/kWh and CitiPower is $1.5/kWh, mainly due to differences in the peak period
- Off-peak prices are $0.10/kWh for 98-99% of the time

Pricing Design and impact Assessment

First Order: Initial Bill Impacts

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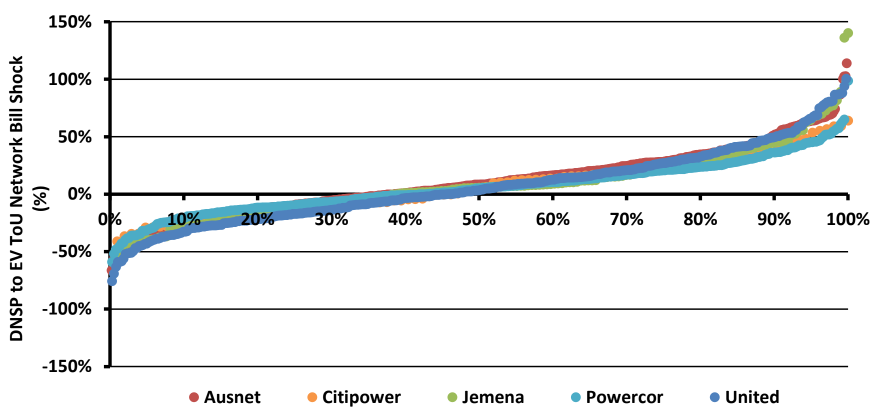
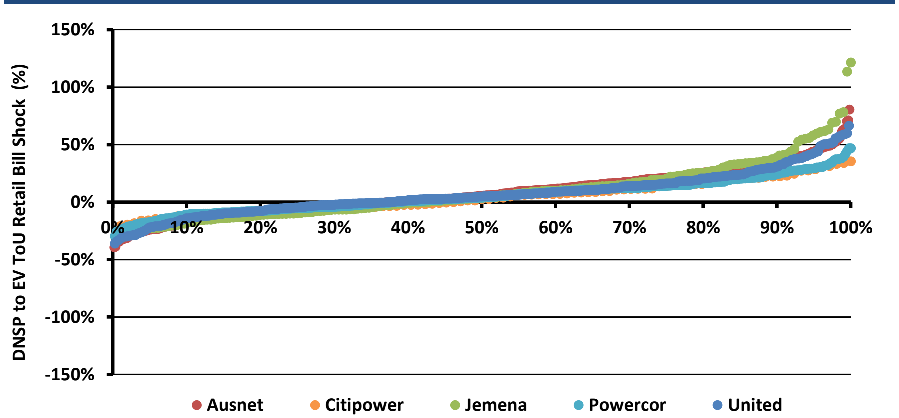
Network and Retail Bill Impacts – Base Consumption

Network



Source: Energeia

Retail



Source: Energeia

- Prices have been set to be revenue neutral at the network and retail level
- So switching from the DNSP ToU to the EV ToU rate should not result in any change in bills on average

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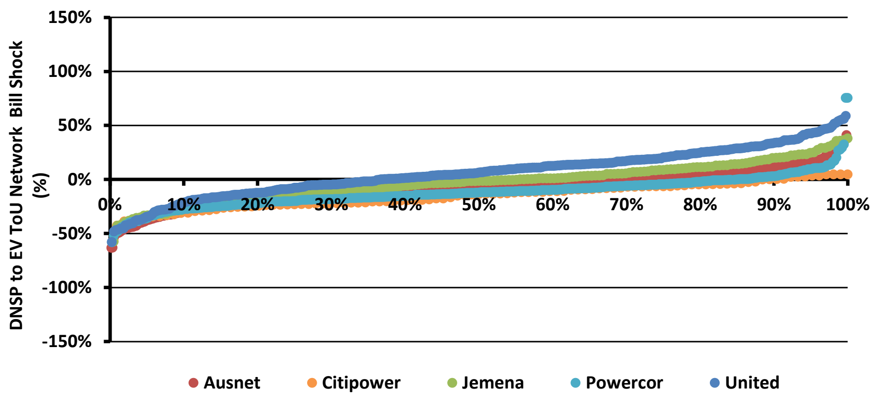
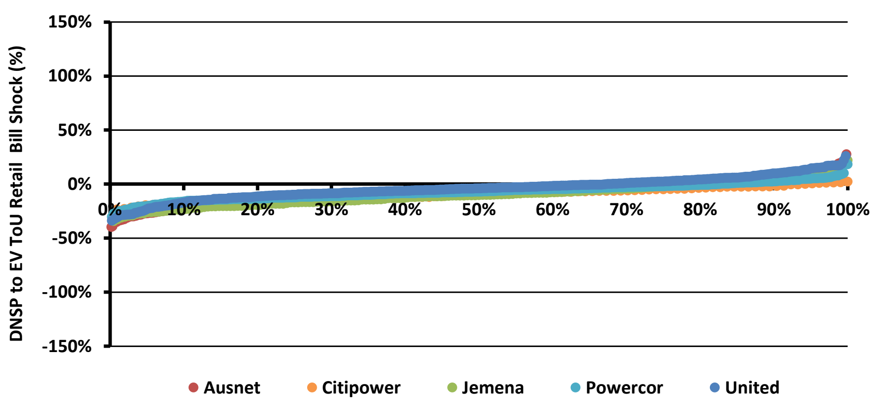
Network and Retail Bill Impacts – Base + EV Load

Network



Source: Energeia, Note: EV Consumption assumed to be 2,044 kWh/p.a.

Retail

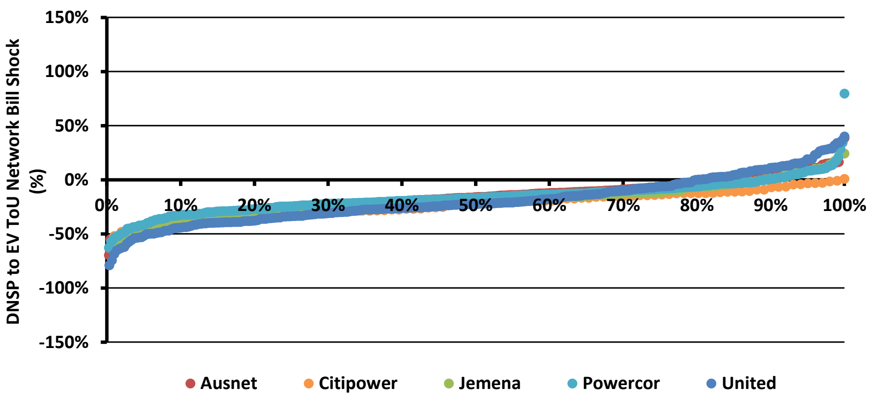


Source: Energeia, Note: EV Consumption assumed to be 2,044 kWh/p.a.

- For consumers with an EV load that they are not managing, the change would result in a slightly lower retail bill on average for most DNSPs
- This reflects unwinding in the cross-subsidy being paid from drivers to consumers in the DNSP ToU rate

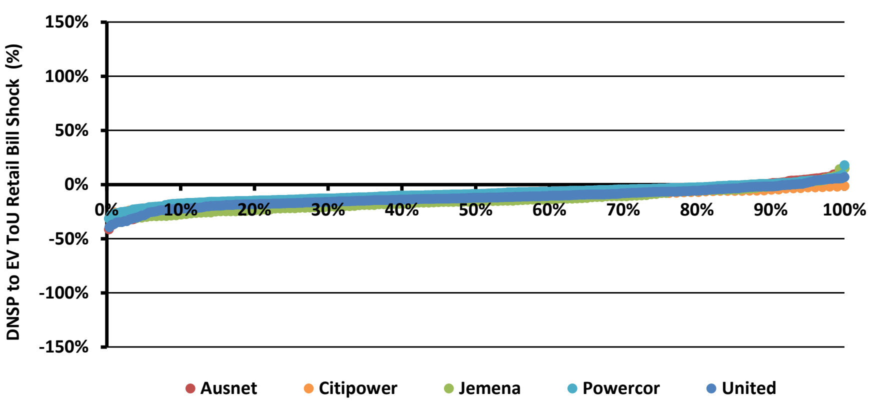
Network and Retail Bill Impacts – Base + EV DR Load

Network



Source: Energeia, Note: EV Consumption assumed to be 2,044 kWh/p.a.

Retail

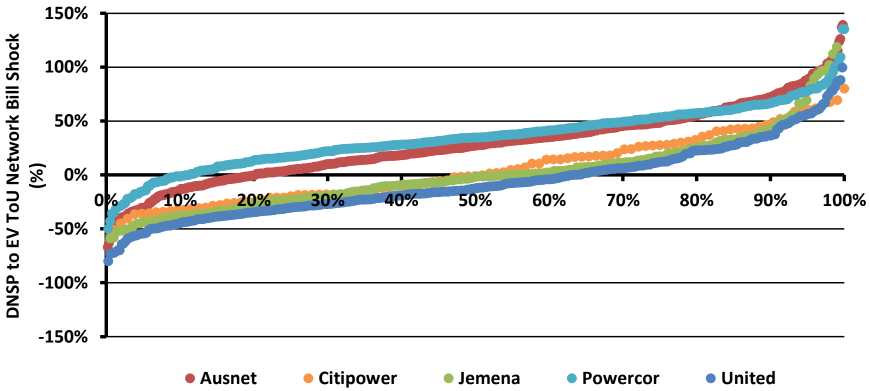


Source: Energeia, Note: EV Consumption assumed to be 2,044 kWh/p.a.

- Almost all customers save on their bill optimising their charging to avoid the peak for the EV ToU tariff as opposed to the DNSP tariff
- Importantly, load control is only required for 1-2% of hours in a year on the EV ToU tariff, compared to 25% of hours on the DNSP tariff
- This analysis shows the significant benefit and incentive for EV drivers to volunteer for this rate

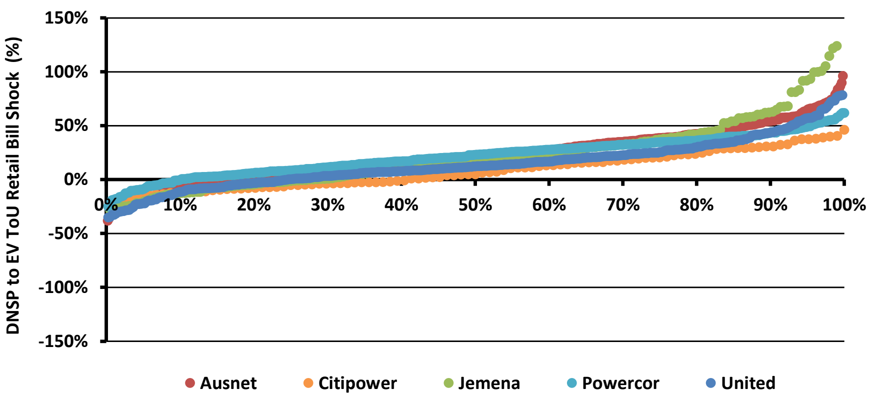
Network and Retail Bill Impacts – Base + PV Consumption

Network



Source: Energeia, Note: PV Capacity assumed to by 4 kW

Retail



Source: Energeia, Note: PV Capacity assumed to by 4 kW

- We also looked at the impact of the rate on rooftop solar PV bill impacts
- Our analysis shows that network and retail bills go up for customers with solar PV
  - This is expected given the EV ToU tariff is more cost reflective
  - The key question is whether the benefits for EVs outweigh the disbenefits related to PV

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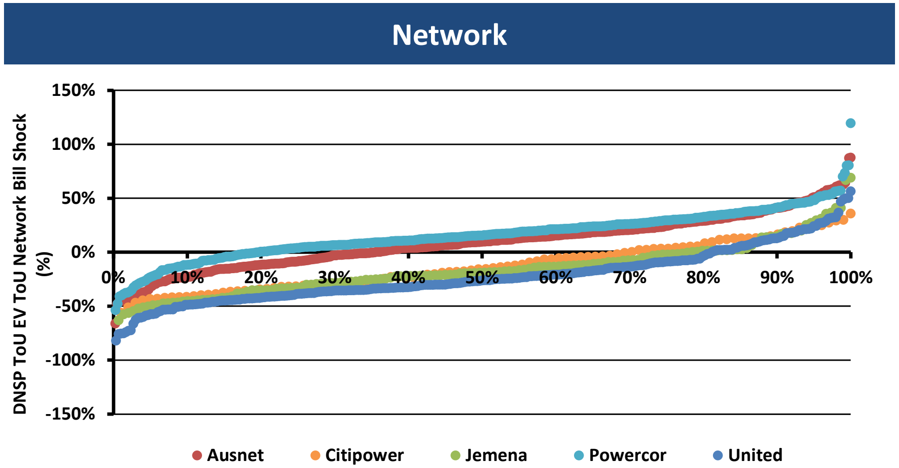
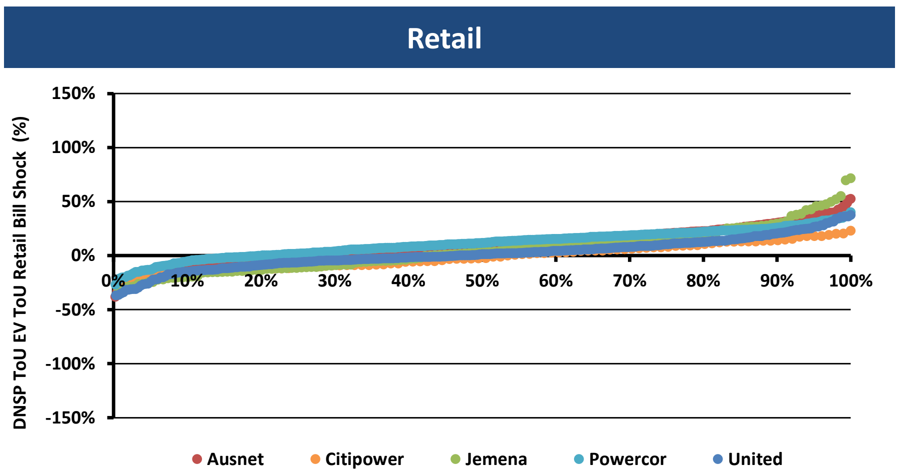
Network and Retail Bill Impacts – Base + PV + EV DR



Source: Energeia, Note: EV Consumption assumed to be 2,044 kWh/p.a., PV Capacity assumed to be 4 kW



Source: Energeia, Note: EV Consumption assumed to be 2,044 kWh/p.a., PV Capacity assumed to be 4 kW

- Energeia also looked at the case of combined EV charging and PV generation, which is likely to be increasingly common for VIC EV drivers
  - It's also important to bear in mind that there is likely to be 2 EVs at most premises over time
- The final outcome when combining optimised EV charging with 4 KW of solar is heavily dependant on the network's peak time
  - United, CitiPower and Jemena customers, with morning/afternoon peaks, saw reduced bills as PV generation reduces network peak
  - Customers on AusNet and Powercor, with evening peaks, see higher bills since PV generation impact peak less
- Across all networks, the average customer is better off optimising their EV charging on the EV ToU tariff as opposed to the DNSP ToU tariff
  - It is also important to bear in mind much reduced peak window that is easier to avoid

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Pricing Design and impact Assessment

Second Order: Incentives and Cross-Subsidies

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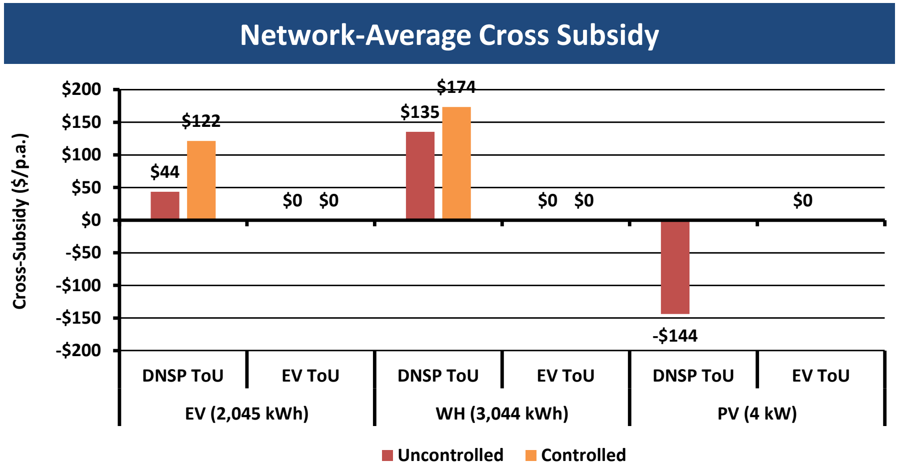
Cross-Subsidies by Load / Generation Type

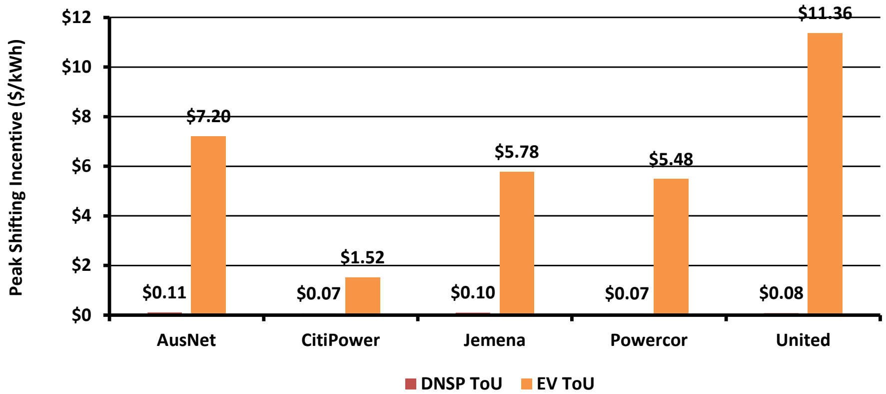


Source: Energeia

- The EV ToU tariff eliminates cross-subsidies by correctly pricing load during the peak, based on calculated LRMC and peak periods
- Energeia's analysis found the DNSP ToU rates charge those with EV's and flexible water heating loads more than their cost of service
- Likewise, the analysis found current rates are cross-subsidising solar PV investments, but not by as much as many may have assumed
- While unwinding cross-subsidies is desirable from an equity and efficiency perspective, the main driver for moving to the EV ToU is the higher DR benefits

Peak Shifting Incentives

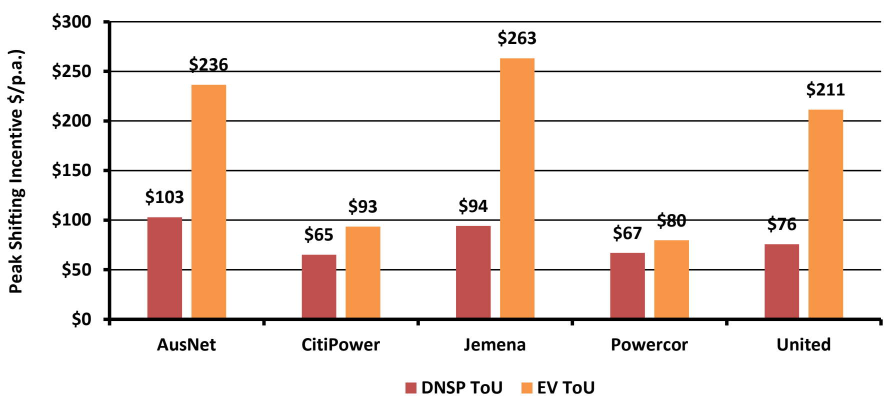
$/kWh Incentive



Source: Energeia

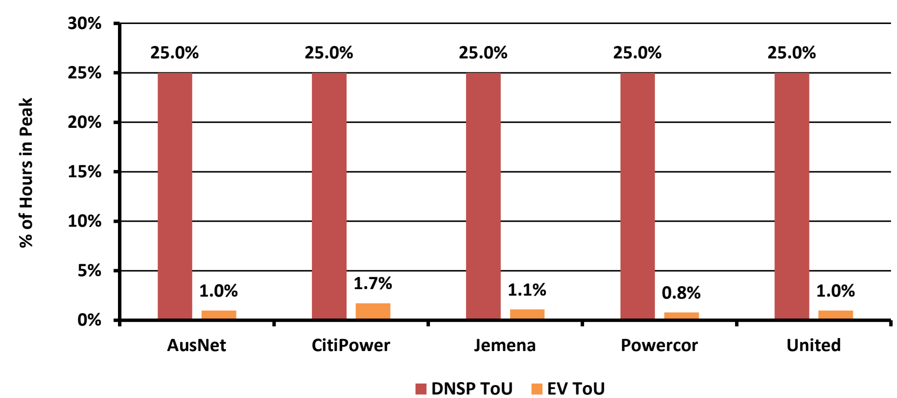
- $/kWh incentives for demand response based on combining LRMC costs and peak period hours
- Prices incentives are much higher per kWh and on a annual EV charging basis
- The approach is expected to significantly increase the ‘addressable’ value of demand response
  - EV DR expected to result in ~100% avoidance

Annual Incentive



Source: Energeia, Note: based on average EV charging load

% of Hours in Peak



Source: Energeia

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Recommendations and Next Steps

Project – Key Recommendations

- In order to achieve the tariff reforms that this work has demonstrated to be in the long-term interests of consumers (those adopting new technology as well as those not adopting it), Energeia recommends that the ECA engage with DNSP, government, regulator, retailer and consumer stakeholders regarding:
  - Making more cost reflective tariff designs available on a voluntary basis
  - How peak periods are set, and the need for significant additional work to get this right
  - What costs are included in LRMC calculations, and agree a methodology for including up to 100% of repex, etc.
- Although not in scope for this project, Energeia also recommends that the ECA consider engaging with the above stakeholders to address the two other key barriers to more efficient consumer investment and consumption incentives and the long-term interests of consumers:
  - Unbundling of network services to unlock the benefits of more efficient DER investment and operation
  - Removing barriers to setting cost reflective prices for exporting energy and not just importing energy

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Thank You

Energeia Pty Ltd
Suite 2, Level 9
171 Clarence Street
Sydney NSW 2000
Australia

P +61 (0)2 8097 0070
energeia@energeia.com.au

energeia.com.au

Appendix 1

DNSP Peak Period Analysis

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DNSP Peak Periods (United)

2018-19 Raw Weekday

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	2%	2%	5%	5%	2%	2%	0%	2%	5%
8:00	2%	0%	0%	2%	2%	5%	10%	2%	2%	0%	2%	7%
8:30	5%	2%	2%	2%	2%	5%	14%	5%	2%	0%	2%	7%
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10:30	5%	5%	2%	0%	2%	5%	60%	7%	2%	0%	5%	5%
11:00	5%	5%	2%	0%	5%	2%	69%	7%	2%	0%	5%	5%
11:30	5%	2%	2%	0%	0%	2%	62%	5%	2%	0%	5%	5%
12:00	2%	2%	2%	0%	2%	5%	55%	7%	2%	0%	2%	5%
12:30	2%	2%	0%	0%	2%	5%	67%	7%	2%	0%	2%	5%
13:00	2%	2%	0%	0%	2%	7%	62%	7%	5%	0%	0%	2%
13:30	2%	0%	0%	0%	0%	12%	31%	7%	5%	0%	2%	5%
14:00	2%	0%	2%	0%	0%	10%	31%	0%	5%	0%	0%	5%
14:30	2%	0%	0%	0%	0%	17%	19%	5%	7%	0%	0%	5%
15:00	0%	0%	0%	0%	0%	26%	19%	2%	21%	0%	0%	5%
15:30	0%	0%	0%	0%	0%	29%	26%	5%	48%	0%	0%	2%
16:00	0%	0%	0%	0%	0%	38%	33%	7%	64%	0%	0%	0%
16:30	0%	0%	0%	0%	0%	33%	43%	12%	62%	0%	0%	0%
17:00	0%	0%	0%	0%	0%	31%	57%	29%	57%	0%	0%	0%
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18:00	0%	0%	0%	0%	0%	12%	60%	17%	50%	0%	0%	0%
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19:00	2%	2%	0%	0%	0%	5%	40%	0%	10%	0%	2%	2%
19:30	2%	2%	0%	0%	0%	2%	31%	2%	2%	0%	2%	2%
20:00	2%	2%	0%	0%	0%	0%	24%	0%	0%	0%	2%	2%
20:30	2%	2%	0%	0%	0%	0%	7%	0%	0%	0%	2%	2%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

2018-19 P10 Weather Weekday

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:00	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	0%	0%
12:30	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	0%	0%
13:00	0%	0%	0%	0%	2%	0%	0%	24%	0%	0%	0%	0%
13:30	0%	0%	0%	0%	2%	0%	0%	24%	0%	0%	0%	0%
14:00	0%	0%	0%	0%	5%	5%	0%	21%	0%	0%	0%	0%
14:30	0%	0%	0%	0%	7%	5%	0%	24%	0%	0%	0%	0%
15:00	0%	0%	0%	0%	7%	14%	0%	52%	0%	0%	0%	0%
15:30	0%	0%	0%	0%	7%	24%	0%	90%	0%	0%	0%	0%
16:00	0%	0%	0%	0%	5%	26%	0%	98%	0%	0%	0%	0%
16:30	0%	0%	0%	0%	2%	21%	0%	98%	0%	0%	0%	0%
17:00	0%	0%	0%	0%	0%	26%	0%	98%	0%	0%	0%	0%
17:30	0%	0%	0%	0%	0%	19%	0%	95%	0%	0%	0%	0%
18:00	0%	0%	0%	0%	0%	14%	0%	95%	0%	0%	0%	0%
18:30	0%	0%	0%	0%	0%	10%	0%	88%	0%	0%	0%	0%
19:00	0%	0%	0%	0%	0%	2%	0%	33%	0%	0%	0%	0%
19:30	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%
20:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
20:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

United CAGR P10 Weekday

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:00	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
10:30	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
11:00	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
11:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:30	0%	0%	0%	0%	2%	0%	2%	2%	0%	0%	0%	0%
13:00	0%	0%	0%	0%	2%	2%	7%	7%	0%	0%	0%	0%
13:30	0%	0%	0%	0%	10%	5%	10%	7%	0%	0%	0%	0%
14:00	0%	0%	0%	0%	10%	2%	2%	2%	0%	0%	0%	0%
14:30	0%	0%	0%	0%	12%	5%	0%	5%	0%	0%	0%	0%
15:00	0%	0%	0%	0%	12%	26%	0%	10%	0%	0%	0%	0%
15:30	0%	0%	0%	0%	10%	31%	0%	17%	0%	0%	0%	0%
16:00	0%	0%	0%	0%	10%	52%	0%	19%	0%	0%	0%	0%
16:30	0%	0%	0%	0%	12%	57%	0%	17%	0%	0%	0%	0%
17:00	0%	0%	0%	0%	5%	57%	0%	24%	0%	0%	0%	0%
17:30	0%	0%	0%	0%	0%	36%	0%	19%	0%	0%	0%	0%
18:00	0%	0%	0%	0%	0%	31%	5%	10%	0%	0%	0%	0%
18:30	0%	0%	0%	0%	0%	10%	10%	14%	0%	0%	0%	0%
19:00	0%	0%	0%	0%	0%	5%	12%	5%	0%	0%	0%	0%
19:30	0%	0%	0%	0%	0%	2%	10%	2%	0%	0%	0%	0%
20:00	0%	0%	0%	0%	0%	0%	10%	0%	0%	0%	0%	0%
20:30	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

2018-19 Raw Weekend

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:30	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:00	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:30	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
14:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
14:30	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%
15:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
15:30	0%	0%	0%	0%	0%	0%	0%	7%	5%	0%	0%	0%
16:00	0%	0%	0%	0%	0%	0%	0%	7%	12%	0%	0%	0%
16:30	0%	0%	0%	0%	0%	0%	0%	7%	19%	0%	0%	0%
17:00	0%	0%	0%	0%	0%	0%	0%	7%	29%	0%	0%	0%
17:30	0%	0%	0%	0%	0%	0%	0%	5%	26%	0%	0%	0%
18:00	0%	0%	0%	0%	0%	0%	0%	0%	21%	0%	0%	2%
18:30	2%	2%	0%	0%	0%	0%	0%	0%	7%	0%	0%	2%
19:00	2%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
19:30	0%	2%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
20:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
20:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

2018-19 P10 Weather Weekend

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
14:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
14:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
15:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
15:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
16:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
16:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
17:00	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%
17:30	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%
18:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
18:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
19:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
19:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
20:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
20:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

United CAGR P10 Weekend

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13:00	0%	0%	0%	0%	0%	2%	0%	2%	0%	0%	0%	0%
13:30	0%	0%	0%	0%	0%	0%	2%	2%	0%	0%	0%	0%
14:00	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
14:30	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
15:00	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
15:30	0%	0%	0%	0%	0%	0%	2%	2%	0%	0%	0%	0%
16:00	0%	0%	0%	0%	0%	0%	2%	5%	0%	0%	0%	0%
16:30	0%	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%
17:00	0%	0%	0%	0%	0%	0%	0%	7%	2%	0%	0%	0%
17:30	0%	0%	0%	0%	0%	0%	0%	0%	10%	0%	0%	0%
18:00	0%	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	0%
18:30	0%	0%	0%	0%	0%	2%	0%	7%	7%	0%	0%	0%
19:00	0%	0%	0%	0%	0%	2%	0%	2%	5%	0%	0%	0%
19:30	0%	0%	0%	0%	0%	2%	0%	5%	5%	0%	0%	0%
20:00	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%	0%
20:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Source: Energeia

- Chart to the left shows UED’s substation weighted average loads using raw, P10 and trended load data
- Trending of last 3 years of ZS data adjusted for P10 weather is used to identify the future peak
- Trending reveals the need to include Dec, Jan and potentially weekend days in the peak period
- Using the technically correct approach shows consumers should benefit from off-peak prices for 99% longer than proposed
- *Energeia recommends red boxed peak periods in the CAGR P10 tables*

DNSP Peak Periods (CitiPower)

2019 Raw Weekday

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:30	0%	4%	0%	0%	0%	0%	7%	0%	0%	0%	0%	4%
9:00	0%	4%	0%	0%	0%	0%	26%	0%	0%	0%	0%	0%
9:30	0%	4%	0%	0%	0%	0%	37%	0%	0%	0%	0%	0%
10:00	0%	4%	0%	0%	0%	0%	56%	0%	0%	0%	0%	0%
10:30	0%	4%	0%	0%	0%	0%	63%	0%	0%	0%	0%	0%
11:00	0%	4%	0%	0%	0%	0%	67%	0%	0%	4%	0%	0%
11:30	0%	4%	4%	0%	7%	0%	85%	0%	0%	4%	0%	0%
12:00	0%	4%	4%	0%	7%	4%	85%	0%	0%	4%	4%	0%
12:30	4%	4%	4%	0%	4%	4%	78%	4%	0%	4%	0%	0%
13:00	4%	4%	4%	0%	11%	11%	78%	4%	0%	4%	0%	0%
13:30	4%	4%	7%	0%	11%	11%	81%	7%	0%	4%	0%	0%
14:00	0%	4%	7%	0%	19%	11%	81%	7%	0%	4%	0%	0%
14:30	4%	4%	11%	0%	19%	15%	70%	11%	0%	7%	0%	0%
15:00	0%	4%	11%	0%	4%	15%	52%	15%	0%	4%	0%	0%
15:30	0%	4%	11%	4%	0%	19%	44%	11%	0%	0%	0%	0%
16:00	0%	4%	11%	4%	0%	22%	56%	11%	0%	0%	0%	0%
16:30	0%	4%	11%	4%	0%	26%	63%	11%	0%	0%	0%	0%
17:00	0%	4%	4%	4%	0%	30%	67%	19%	0%	0%	0%	0%
17:30	0%	0%	0%	0%	0%	37%	59%	7%	0%	0%	0%	0%
18:00	0%	0%	0%	7%	7%	37%	41%	11%	0%	0%	11%	4%
18:30	4%	7%	0%	7%	7%	37%	33%	22%	11%	0%	11%	11%
19:00	7%	11%	4%	7%	7%	33%	33%	19%	11%	0%	11%	11%
19:30	7%	11%	4%	7%	7%	30%	26%	0%	7%	0%	11%	11%
20:00	7%	7%	4%	0%	4%	30%	26%	0%	4%	0%	11%	11%
20:30	4%	4%	0%	0%	0%	15%	26%	0%	0%	0%	7%	7%
21:00	4%	0%	0%	0%	0%	11%	19%	0%	0%	0%	4%	7%
21:30	0%	0%	0%	0%	0%	7%	15%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

2019 P10 Weather Weekday

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	0%	0%	11%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	11%	0%	0%	11%	0%	0%	0%	0%	0%	0%
8:30	0%	0%	19%	0%	0%	11%	0%	0%	0%	0%	0%	0%
9:00	0%	0%	0%	0%	0%	11%	19%	0%	0%	0%	0%	0%
9:30	0%	0%	0%	0%	0%	11%	26%	0%	0%	0%	0%	0%
10:00	0%	0%	0%	0%	0%	7%	33%	0%	0%	0%	0%	0%
10:30	0%	0%	0%	0%	0%	26%	52%	0%	0%	0%	0%	0%
11:00	0%	0%	0%	0%	11%	33%	59%	0%	0%	0%	0%	0%
11:30	0%	0%	0%	0%	22%	56%	67%	0%	0%	0%	0%	0%
12:00	0%	0%	0%	0%	33%	52%	59%	0%	0%	0%	0%	0%
12:30	0%	0%	0%	15%	33%	52%	59%	0%	0%	0%	0%	0%
13:00	0%	0%	0%	11%	59%	52%	59%	0%	0%	0%	0%	0%
13:30	0%	0%	0%	26%	67%	56%	63%	0%	0%	0%	0%	0%
14:00	0%	0%	0%	26%	67%	52%	56%	0%	0%	0%	0%	0%
14:30	0%	0%	0%	41%	81%	52%	33%	0%	0%	4%	0%	0%
15:00	0%	0%	0%	33%	74%	63%	30%	0%	0%	0%	0%	0%
15:30	0%	0%	0%	37%	0%	67%	22%	0%	0%	0%	0%	0%
16:00	0%	0%	0%	56%	0%	74%	37%	0%	0%	0%	0%	0%
16:30	0%	0%	0%	67%	0%	78%	44%	0%	0%	0%	0%	0%
17:00	0%	0%	0%	70%	0%	93%	41%	0%	0%	0%	0%	0%
17:30	0%	0%	0%	56%	0%	96%	41%	0%	0%	0%	0%	0%
18:00	0%	0%	0%	26%	0%	85%	26%	7%	0%	0%	0%	0%
18:30	0%	0%	0%	19%	0%	63%	22%	7%	0%	0%	0%	0%
19:00	0%	0%	0%	15%	0%	63%	22%	7%	0%	0%	0%	0%
19:30	0%	0%	0%	15%	0%	59%	19%	0%	0%	0%	0%	0%
20:00	0%	0%	0%	0%	0%	41%	15%	0%	0%	0%	0%	0%
20:30	0%	0%	0%	0%	0%	41%	15%	0%	0%	0%	0%	0%
21:00	0%	0%	0%	0%	0%	30%	7%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	7%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

CAGR P10 Weekday

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	4%	0%	0%	11%	0%	0%	0%	0%	0%	0%
8:30	0%	0%	4%	0%	0%	0%	15%	0%	0%	0%	0%	0%
9:00	0%	0%	0%	0%	0%	0%	22%	0%	0%	0%	0%	0%
9:30	0%	0%	0%	4%	0%	4%	26%	0%	0%	0%	0%	0%
10:00	0%	0%	0%	0%	0%	0%	48%	0%	0%	0%	0%	0%
10:30	0%	4%	0%	4%	0%	0%	56%	0%	0%	0%	0%	0%
11:00	0%	4%	0%	4%	0%	0%	56%	0%	0%	0%	0%	0%
11:30	0%	4%	0%	4%	4%	0%	70%	0%	0%	0%	0%	0%
12:00	0%	4%	4%	4%	4%	4%	70%	0%	0%	0%	0%	0%
12:30	0%	4%	4%	4%	0%	0%	70%	0%	0%	0%	0%	0%
13:00	4%	4%	4%	4%	7%	4%	67%	0%	0%	0%	0%	0%
13:30	11%	4%	4%	4%	0%	4%	70%	0%	0%	0%	0%	0%
14:00	4%	0%	4%	0%	7%	0%	70%	0%	0%	0%	0%	0%
14:30	7%	0%	4%	0%	19%	0%	56%	0%	0%	0%	0%	0%
15:00	7%	0%	0%	0%	15%	0%	52%	4%	0%	0%	0%	0%
15:30	7%	0%	4%	0%	0%	0%	44%	0%	0%	0%	0%	0%
16:00	7%	0%	4%	0%	0%	0%	48%	0%	0%	0%	0%	0%
16:30	4%	0%	4%	0%	0%	0%	52%	0%	0%	0%	0%	0%
17:00	0%	0%	0%	15%	0%	0%	48%	0%	0%	0%	0%	0%
17:30	0%	0%	4%	15%	0%	0%	37%	0%	0%	0%	0%	0%
18:00	0%	0%	0%	15%	0%	0%	30%	0%	0%	0%	0%	0%
18:30	0%	0%	0%	11%	0%	0%	26%	0%	0%	0%	0%	0%
19:00	0%	0%	0%	0%	0%	0%	26%	0%	0%	0%	0%	0%
19:30	0%	0%	0%	0%	0%	4%	19%	0%	0%	0%	0%	0%
20:00	0%	0%	0%	0%	0%	4%	11%	0%	0%	0%	0%	0%
20:30	0%	0%	0%	0%	0%	0%	11%	0%	0%	0%	0%	0%
21:00	0%	0%	0%	0%	0%	0%	7%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

2019 Raw Weekend

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%
8:30	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%
9:00	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%
9:30	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%
10:00	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%
10:30	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%
11:00	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%
11:30	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%
12:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%
13:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%
13:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%
14:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	7%
14:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%
15:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%
15:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%
16:00	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	15%
16:30	0%	0%	0%	0%	0%	0%	0%	4%	4%	0%	0%	7%
17:00	0%	0%	0%	0%	0%	0%	0%	4%	4%	0%	0%	4%
17:30	0%	0%	0%	0%	0%	0%	0%	11%	4%	0%	0%	4%
18:00	7%	0%	4%	0%	0%	0%	0%	11%	4%	0%	0%	7%
18:30	7%	0%	11%	0%	0%	11%	0%	15%	0%	4%	0%	15%
19:00	7%	0%	11%	0%	0%	11%	0%	4%	0%	4%	0%	15%
19:30	7%	0%	7%	0%	0%	11%	0%	0%	0%	4%	0%	15%
20:00	4%	0%	7%	0%	0%	7%	0%	0%	0%	0%	0%	7%
20:30	0%	0%	7%	0%	0%	7%	0%	0%	0%	0%	0%	4%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%

2019 P10 Weather Weekend

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%
9:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%
10:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%
10:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%
11:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
13:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
13:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
14:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
14:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
15:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
15:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
16:00	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	7%
16:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
17:00	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	4%
17:30	0%	0%	0%	0%	0%	0%	0%	7%	4%	0%	0%	4%
18:00	0%	0%	0%	0%	0%	0%	0%	7%	4%	0%	0%	11%
18:30	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	0%	15%
19:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	15%
19:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	11%
20:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
20:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

CAGR P10 Weekend

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%
8:30	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%
9:00	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	7%
9:30	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	11%
10:00	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	15%
10:30	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	15%
11:00	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%
11:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
13:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
14:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
14:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
15:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
15:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
16:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
16:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
17:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
17:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
18:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	19%
18:30	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%	15%
19:00	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%	7%
19:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
20:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
20:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	7%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

- Analysis of CitiPower's zone substation peak periods shows P10 weather resulting in a large peak spread, however, the underlying trend moves to a Jan peak only
- *Energeia recommends red boxed peak periods in the CAGR P10 tables*

Source: Energeia

DNSP Peak Periods (Jemena)

2018-19 Raw Weekday

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	16%	4%	0%	0%	0%	0%
7:30	4%	0%	0%	0%	0%	0%	28%	4%	0%	0%	4%	8%
8:00	4%	4%	0%	0%	4%	0%	40%	4%	0%	0%	4%	8%
8:30	4%	4%	0%	0%	4%	0%	44%	4%	0%	0%	4%	4%
9:00	4%	8%	0%	0%	4%	0%	60%	4%	0%	0%	4%	4%
9:30	8%	8%	0%	0%	4%	0%	68%	4%	0%	0%	0%	4%
10:00	4%	8%	0%	0%	0%	4%	68%	4%	0%	0%	4%	4%
10:30	0%	4%	0%	0%	0%	8%	76%	4%	0%	0%	0%	0%
11:00	4%	4%	0%	0%	0%	8%	76%	4%	0%	0%	0%	0%
11:30	4%	0%	0%	0%	0%	4%	72%	4%	4%	0%	0%	4%
12:00	0%	0%	0%	0%	0%	4%	72%	8%	4%	0%	0%	4%
12:30	0%	4%	0%	0%	0%	4%	76%	12%	4%	0%	0%	0%
13:00	0%	4%	0%	0%	0%	12%	68%	8%	12%	0%	0%	0%
13:30	0%	4%	0%	0%	0%	4%	56%	16%	16%	0%	0%	0%
14:00	0%	0%	0%	0%	0%	8%	44%	12%	24%	0%	0%	0%
14:30	0%	0%	0%	0%	0%	28%	52%	16%	40%	0%	0%	0%
15:00	0%	0%	0%	0%	0%	36%	56%	28%	52%	0%	0%	0%
15:30	0%	0%	0%	0%	0%	48%	48%	24%	52%	0%	0%	0%
16:00	0%	0%	0%	0%	0%	28%	48%	32%	64%	0%	0%	0%
16:30	0%	0%	0%	0%	0%	32%	72%	44%	72%	0%	0%	0%
17:00	0%	0%	0%	0%	0%	8%	72%	48%	72%	0%	0%	0%
17:30	0%	0%	0%	0%	0%	8%	68%	56%	48%	0%	0%	0%
18:00	0%	0%	0%	0%	0%	8%	68%	24%	32%	0%	8%	4%
18:30	0%	4%	0%	0%	0%	0%	64%	12%	8%	0%	8%	4%
19:00	4%	0%	0%	0%	0%	0%	64%	4%	4%	0%	8%	4%
19:30	0%	0%	0%	0%	0%	0%	56%	0%	4%	0%	4%	4%
20:00	0%	0%	0%	0%	0%	0%	40%	0%	0%	0%	0%	0%
20:30	0%	0%	0%	0%	0%	0%	24%	0%	0%	0%	0%	0%
21:00	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

2018-19 P10 Weather Weekday

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:30	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%
13:00	0%	0%	0%	0%	4%	0%	0%	12%	0%	0%	0%	0%
13:30	0%	0%	0%	0%	4%	0%	0%	20%	0%	0%	0%	0%
14:00	0%	0%	0%	0%	0%	4%	0%	44%	0%	0%	0%	0%
14:30	0%	0%	0%	0%	4%	16%	0%	68%	0%	0%	0%	0%
15:00	0%	0%	0%	0%	8%	20%	0%	76%	0%	0%	0%	0%
15:30	0%	0%	0%	0%	4%	40%	0%	96%	0%	0%	0%	0%
16:00	0%	0%	0%	0%	4%	28%	0%	92%	0%	0%	0%	0%
16:30	0%	0%	0%	0%	4%	24%	0%	92%	0%	0%	0%	0%
17:00	0%	0%	0%	0%	0%	8%	0%	88%	0%	0%	0%	0%
17:30	0%	0%	0%	0%	0%	8%	0%	88%	0%	0%	0%	0%
18:00	0%	0%	0%	0%	0%	4%	0%	80%	0%	0%	0%	0%
18:30	0%	0%	0%	0%	0%	4%	0%	68%	0%	0%	0%	0%
19:00	0%	0%	0%	0%	0%	0%	0%	20%	0%	0%	0%	0%
19:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
20:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
20:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

CAGR P10 Weekday

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	4%
7:30	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	4%	4%
8:00	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%	4%
8:30	0%	0%	0%	0%	4%	0%	0%	0%	0%	0%	0%	0%
9:00	0%	0%	0%	0%	4%	4%	0%	0%	0%	0%	0%	0%
9:30	0%	0%	0%	0%	4%	4%	0%	0%	0%	0%	0%	0%
10:00	0%	0%	0%	0%	4%	8%	0%	0%	4%	0%	0%	0%
10:30	0%	0%	0%	0%	4%	4%	0%	0%	4%	0%	0%	0%
11:00	0%	0%	0%	0%	0%	4%	0%	4%	0%	0%	0%	0%
11:30	0%	0%	0%	0%	0%	0%	4%	4%	0%	0%	0%	0%
12:00	0%	0%	0%	0%	0%	4%	0%	4%	0%	0%	0%	0%
12:30	0%	0%	0%	0%	4%	8%	4%	12%	0%	0%	0%	0%
13:00	0%	0%	0%	0%	4%	16%	4%	8%	0%	0%	0%	0%
13:30	0%	0%	0%	0%	4%	12%	0%	4%	0%	0%	0%	0%
14:00	0%	0%	0%	0%	0%	4%	8%	4%	0%	0%	0%	0%
14:30	0%	0%	0%	0%	4%	8%	12%	12%	0%	0%	0%	0%
15:00	0%	0%	0%	0%	0%	8%	12%	28%	0%	0%	0%	0%
15:30	0%	0%	0%	0%	0%	24%	0%	44%	0%	0%	0%	0%
16:00	0%	0%	0%	0%	0%	32%	0%	56%	0%	0%	0%	0%
16:30	0%	0%	0%	0%	0%	44%	8%	52%	0%	0%	0%	0%
17:00	0%	0%	0%	0%	0%	32%	8%	48%	0%	0%	0%	0%
17:30	0%	0%	0%	0%	0%	24%	16%	32%	0%	0%	0%	0%
18:00	0%	0%	0%	0%	0%	20%	28%	24%	0%	0%	0%	4%
18:30	0%	0%	0%	0%	0%	8%	24%	16%	0%	0%	0%	8%
19:00	4%	8%	0%	0%	0%	4%	20%	8%	0%	0%	0%	8%
19:30	4%	0%	0%	0%	0%	4%	32%	4%	0%	0%	0%	4%
20:00	0%	4%	0%	0%	0%	4%	32%	0%	0%	0%	0%	4%
20:30	0%	0%	0%	0%	0%	0%	20%	0%	0%	0%	0%	4%
21:00	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

2018-19 Raw Weekend

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
14:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
14:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
15:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
15:30	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%
16:00	0%	0%	0%	0%	0%	0%	0%	0%	8%	0%	0%	0%
16:30	0%	0%	0%	0%	0%	0%	0%	0%	16%	0%	0%	0%
17:00	0%	0%	0%	0%	0%	0%	0%	0%	12%	0%	0%	0%
17:30	0%	0%	0%	0%	0%	0%	0%	0%	8%	0%	0%	0%
18:00	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%
18:30	0%	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	4%
19:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
19:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
20:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
20:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

2018-19 P10 Weather Weekend

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
14:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
14:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
15:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
15:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
16:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
16:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
17:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
17:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
18:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
18:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
19:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
19:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
20:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
20:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

CAGR P10 Weekend

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13:30	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%
14:00	0%	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%	0%
14:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
15:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
15:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
16:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
16:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
17:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
17:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
18:00	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
18:30	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
19:00	0%	4%	0%	0%	0%	0%	0%	0%	0%	0%	0%	4%
19:30	0%	4%	0%	0%	0%	0%	0%	0%	4%	0%	0%	0%
20:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
20:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

- Analysis of Jemena's zone substation peak periods shows P10 and trend analysis significantly reducing the peak period
- *Energeia recommends red boxed peak periods in the CAGR P10 tables*

Source: Energeia

DNSP Peak Periods (Powercor)

2019 Raw Weekday

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	8%	8%	5%	3%	5%	3%	3%	0%	0%	3%	3%	5%
0:30	3%	3%	5%	8%	5%	8%	5%	3%	3%	3%	0%	3%
1:00	3%	0%	0%	3%	3%	5%	3%	0%	3%	3%	0%	3%
1:30	3%	0%	0%	3%	3%	5%	3%	0%	0%	0%	0%	3%
2:00	3%	0%	0%	0%	0%	3%	3%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	8%	0%	0%	0%	0%	0%	0%
6:30	3%	0%	3%	0%	0%	8%	3%	0%	0%	3%	0%	3%
7:00	3%	0%	3%	0%	3%	3%	3%	0%	0%	3%	0%	3%
7:30	5%	3%	3%	5%	3%	5%	8%	3%	3%	0%	0%	5%
8:00	3%	3%	3%	3%	0%	5%	5%	3%	3%	3%	5%	5%
8:30	0%	5%	0%	3%	3%	5%	13%	3%	3%	5%	3%	5%
9:00	0%	0%	0%	3%	3%	3%	15%	3%	3%	0%	3%	5%
9:30	0%	0%	0%	3%	5%	5%	13%	3%	0%	0%	3%	5%
10:00	3%	0%	0%	0%	3%	8%	15%	3%	3%	3%	3%	3%
10:30	3%	3%	0%	0%	3%	5%	15%	3%	3%	3%	3%	3%
11:00	5%	3%	0%	3%	3%	5%	18%	3%	3%	3%	3%	3%
11:30	5%	0%	0%	3%	3%	8%	18%	3%	3%	5%	3%	5%
12:00	0%	0%	3%	3%	3%	8%	23%	3%	3%	3%	3%	3%
12:30	3%	0%	0%	3%	5%	3%	23%	3%	3%	5%	3%	3%
13:00	0%	0%	3%	0%	8%	8%	25%	3%	3%	3%	3%	3%
13:30	5%	0%	3%	3%	8%	5%	28%	3%	3%	3%	3%	3%
14:00	3%	0%	3%	3%	10%	5%	25%	3%	3%	3%	3%	3%
14:30	0%	0%	3%	3%	13%	10%	30%	3%	5%	3%	3%	3%
15:00	3%	0%	3%	0%	8%	13%	33%	3%	5%	5%	3%	0%
15:30	3%	0%	3%	3%	5%	13%	30%	3%	5%	3%	0%	0%
16:00	3%	0%	0%	3%	0%	15%	40%	5%	0%	5%	0%	0%
16:30	0%	3%	5%	0%	3%	20%	48%	8%	3%	5%	0%	0%
17:00	5%	5%	0%	3%	5%	25%	50%	10%	3%	10%	3%	0%
17:30	3%	5%	0%	3%	3%	38%	55%	8%	5%	10%	5%	5%
18:00	8%	8%	3%	3%	5%	45%	63%	13%	5%	10%	10%	5%
18:30	5%	5%	5%	3%	8%	45%	68%	10%	5%	13%	8%	5%
19:00	3%	5%	5%	0%	3%	53%	70%	5%	5%	18%	3%	5%
19:30	3%	5%	3%	0%	3%	53%	73%	5%	0%	13%	3%	5%
20:00	0%	0%	0%	0%	3%	45%	68%	3%	0%	8%	0%	5%
20:30	0%	0%	0%	0%	3%	40%	50%	0%	0%	5%	0%	0%
21:00	0%	0%	0%	0%	3%	20%	35%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	3%	13%	10%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	3%	3%	5%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	3%	3%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	3%	3%	0%	0%	3%	0%	3%
23:30	13%	13%	10%	13%	8%	8%	13%	8%	8%	8%	13%	13%

2019 P10 Weather Weekday

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	3%
12:00	0%	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%
12:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
13:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
14:00	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%
14:30	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%
15:00	0%	0%	0%	0%	0%	8%	0%	0%	0%	0%	0%	0%
15:30	0%	0%	0%	0%	0%	8%	0%	0%	0%	0%	0%	0%
16:00	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%
16:30	0%	0%	0%	0%	0%	8%	0%	0%	0%	0%	0%	0%
17:00	0%	0%	0%	0%	0%	10%	0%	0%	0%	0%	0%	0%
17:30	0%	0%	0%	0%	0%	20%	0%	0%	0%	0%	0%	0%
18:00	0%	0%	0%	0%	0%	30%	0%	0%	0%	0%	0%	0%
18:30	0%	0%	0%	0%	0%	28%	0%	0%	0%	0%	0%	0%
19:00	0%	0%	0%	0%	0%	20%	0%	0%	0%	0%	0%	0%
19:30	0%	0%	0%	0%	0%	13%	0%	0%	0%	0%	0%	0%
20:00	0%	0%	0%	0%	0%	15%	0%	0%	0%	0%	0%	0%
20:30	0%	0%	0%	0%	0%	8%	0%	0%	0%	0%	0%	0%
21:00	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	8%	0%	0%	0%	0%	0%	0%

P10 CAGR Weekday

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	8%	0%	5%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:30	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:00	0%	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%
9:30	0%	0%	0%	0%	3%	3%	5%	0%	0%	0%	0%	0%
10:00	0%	0%	0%	0%	0%	3%	5%	0%	0%	0%	0%	0%
10:30	0%	0%	0%	0%	0%	0%	10%	0%	0%	0%	0%	0%
11:00	0%	0%	0%	0%	0%	0%	13%	0%	0%	0%	0%	0%
11:30	0%	0%	0%	0%	0%	3%	15%	0%	0%	0%	0%	3%
12:00	0%	0%	0%	0%	0%	0%	18%	0%	0%	0%	0%	0%
12:30	0%	0%	0%	0%	0%	0%	15%	0%	0%	0%	0%	0%
13:00	0%	0%	0%	0%	0%	0%	15%	0%	0%	0%	0%	0%
13:30	0%	0%	0%	0%	3%	0%	13%	0%	0%	0%	0%	0%
14:00	0%	0%	0%	0%	0%	0%	8%	0%	0%	0%	0%	0%
14:30	0%	0%	0%	0%	0%	3%	10%	0%	0%	3%	0%	0%
15:00	0%	0%	0%	0%	0%	3%	8%	0%	0%	5%	0%	0%
15:30	0%	0%	0%	0%	0%	5%	5%	0%	0%	8%	0%	0%
16:00	0%	0%	3%	0%	0%	5%	8%	0%	0%	8%	0%	0%
16:30	0%	0%	3%	0%	0%	3%	8%	0%	0%	8%	0%	0%
17:00	0%	0%	3%	0%	0%	3%	5%	0%	0%	8%	0%	0%
17:30	0%	0%	3%	0%	0%	0%	8%	0%	0%	15%	0%	0%
18:00	0%	0%	0%	0%	0%	5%	13%	3%	0%	13%	0%	3%
18:30	0%	0%	0%	0%	0%	8%	13%	0%	0%	13%	0%	3%
19:00	0%	0%	0%	0%	0%	10%	30%	0%	0%	10%	0%	3%
19:30	0%	0%	0%	0%	0%	8%	33%	0%	0%	10%	0%	0%
20:00	0%	0%	0%	0%	0%	8%	35%	0%	0%	10%	0%	0%
20:30	0%	0%	0%	0%	0%	8%	35%	0%	0%	10%	0%	0%
21:00	0%	0%	0%	0%	0%	8%	28%	0%	0%	5%	0%	0%
21:30	0%	0%	0%	0%	0%	5%	15%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	5%	8%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	3%	3%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%

2019 Raw Weekend

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	3%	5%	5%	0%	0%	5%	3%	3%	0%	3%	0%	3%
0:30	0%	0%	0%	3%	0%	3%	3%	3%	3%	0%	0%	0%
1:00	0%	0%	0%	3%	0%	3%	3%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	3%	3%	3%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	3%	3%	0%	0%	0%	0%	0%
7:30	0%	3%	0%	3%	0%	3%	3%	0%	0%	0%	3%	0%
8:00	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:30	0%	3%	5%	0%	0%	3%	0%	0%	0%	0%	0%	0%
9:00	0%	3%	3%	0%	0%	3%	0%	0%	0%	0%	0%	0%
9:30	0%	0%	3%	0%	0%	3%	3%	0%	0%	0%	0%	0%
10:00	0%	0%	5%	0%	0%	3%	3%	0%	0%	0%	0%	0%
10:30	0%	0%	3%	0%	0%	5%	3%	0%	0%	0%	0%	0%
11:00	0%	3%	3%	0%	0%	5%	0%	0%	3%	0%	0%	0%
11:30	0%	0%	0%	0%	0%	5%	3%	0%	3%	0%	0%	0%
12:00	0%	0%	0%	0%	3%	3%	3%	0%	3%	0%	0%	0%
12:30	0%	0%	0%	0%	0%	5%	3%	0%	3%	0%	0%	0%
13:00	0%	0%	0%	0%	0%	5%	0%	0%	3%	0%	0%	0%
13:30	0%	0%	0%	0%	0%	5%	0%	0%	3%	0%	0%	0%
14:00	0%	0%	3%	0%	3%	5%	0%	0%	3%	0%	0%	3%
14:30	0%	0%	3%	0%	3%	0%	0%	0%	3%	0%	0%	0%
15:00	0%	0%	0%	0%	3%	3%	0%	0%	3%	0%	0%	0%
15:30	0%	0%	0%	0%	3%	3%	0%	0%	3%	0%	0%	0%
16:00	0%	0%	0%	0%	0%	3%	0%	0%	3%	0%	0%	0%
16:30	0%	0%	3%	0%	0%	3%	0%	0%	3%	0%	0%	3%
17:00	0%	0%	3%	0%	0%	3%	0%	3%	5%	0%	0%	0%
17:30	0%	0%	3%	0%	0%	5%	0%	5%	5%	3%	0%	0%
18:00	0%	0%	5%	0%	0%	10%	0%	5%	3%	3%	0%	3%
18:30	0%	0%	8%	0%	0%	13%	0%	5%	5%	0%	0%	3%
19:00	0%	0%	0%	0%	0%	13%	0%	3%	5%	0%	0%	0%
19:30	0%	0%	0%	0%	0%	13%	0%	0%	3%	0%	0%	0%
20:00	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%
20:30	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%
21:00	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	5%	8%	8%	3%	0%	10%	3%	3%	8%	8%	0%	8%

2019 P10 Weather Weekend

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	10%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:30	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%
12:00	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%
12:30	0%	0%	0%	0%	0%	8%	0%	0%	0%	0%	0%	0%
13:00	0%	0%	0%	0%	0%	8%	0%	0%	0%	0%	0%	0%
13:30	0%	0%	0%	0%	0%	13%	0%	0%	0%	0%	0%	0%
14:00	0%	0%	0%	0%	0%	15%	0%	0%	0%	0%	0%	0%
14:30	0%	0%	0%	0%	0%	[illegible]	0%	0%	13%	0%	0%	0%
15:00	0%	0%	0%	0%	0%	28%	0%	0%	15%	0%	0%	0%
15:30	0%	0%	0%	0%	0%	40%	0%	0%	13%	0%	0%	0%
16:00	0%	0%	0%	0%	0%	60%	0%	0%	0%	0%	0%	0%
16:30	0%	0%	0%	0%	0%	80%	0%	0%	0%	0%	0%	0%
17:00	0%	0%	0%	0%	0%	93%	0%	0%	0%	0%	0%	0%
17:30	0%	0%	0%	0%	0%	95%	0%	0%	0%	0%	0%	0%
18:00	0%	0%	0%	0%	0%	98%	0%	0%	0%	0%	0%	0%
18:30	0%	0%	0%	0%	0%	98%	0%	0%	0%	0%	0%	0%
19:00	0%	0%	0%	0%	0%	93%	0%	0%	0%	0%	0%	0%
19:30	0%	0%	0%	0%	0%	60%	0%	0%	0%	0%	0%	0%
20:00	0%	0%	0%	0%	0%	35%	0%	0%	0%	0%	0%	0%
20:30	0%	0%	0%	0%	0%	8%	0%	0%	0%	0%	0%	0%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

P10 CAGR Weekend

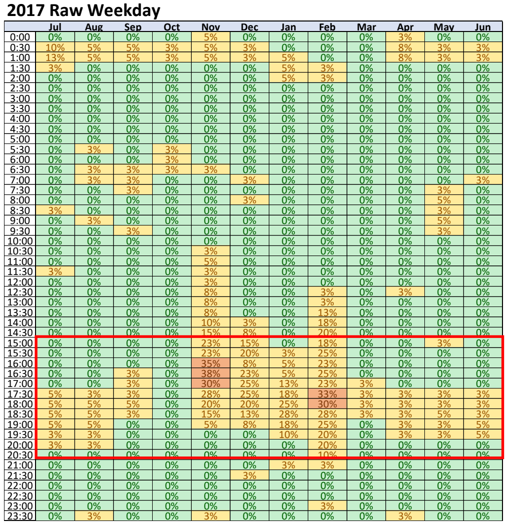
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:30	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:30	0%	0%	3%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
11:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:30	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%
13:00	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%
13:30	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%
14:00	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%
14:30	0%	0%	0%	0%	0%	3%	0%	0%	3%	0%	0%	0%
15:00	0%	0%	0%	0%	0%	5%	0%	0%	3%	0%	0%	0%
15:30	0%	0%	0%	0%	0%	5%	0%	0%	3%	0%	0%	0%
16:00	0%	0%	0%	0%	0%	13%	0%	0%	0%	0%	0%	0%
16:30	0%	0%	0%	0%	0%	15%	0%	0%	5%	0%	0%	3%
17:00	0%	0%	3%	0%	0%	18%	0%	0%	3%	0%	0%	5%
17:30	0%	0%	3%	0%	0%	25%	0%	3%	3%	0%	0%	3%
18:00	0%	0%	3%	0%	0%	28%	0%	5%	3%	0%	0%	3%
18:30	0%	0%	5%	0%	0%	28%	0%	8%	5%	0%	0%	3%
19:00	0%	0%	0%	0%	0%	20%	0%	5%	3%	0%	0%	0%
19:30	0%	0%	0%	0%	0%	13%	0%	3%	3%	0%	0%	0%
20:00	0%	0%	0%	0%	0%	8%	0%	0%	3%	0%	0%	0%
20:30	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	0%	0%
21:00	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	13%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	3%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	5%	0%	0%	3%	0%	3%	3%	0%	0%	0%

- Analysis of Powercor's zone substation peak periods shows significant variation between raw, P10 and trend analysis
- *Energeia recommends red boxed peak periods in the CAGR P10 tables*

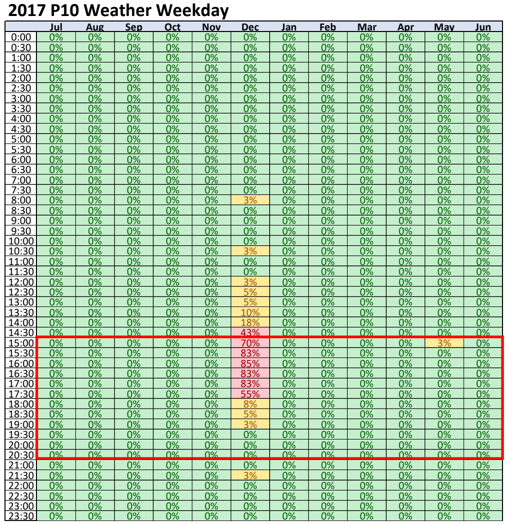
Source: Energeia

DNSP Peak Periods (AusNet)

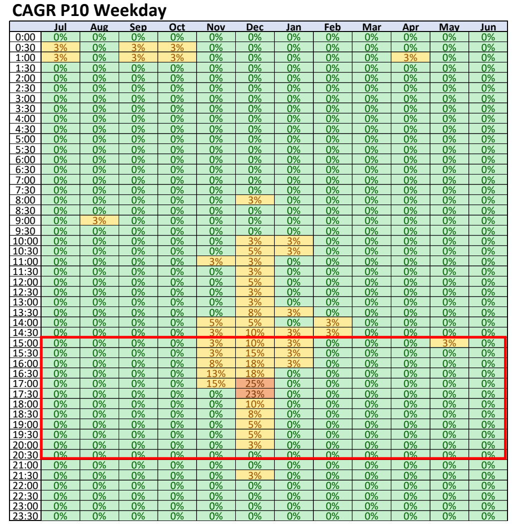
2017 Raw Weekday



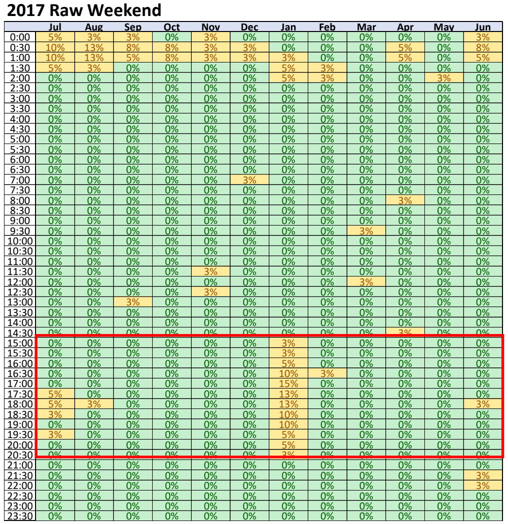
2017 P10 Weather Weekday



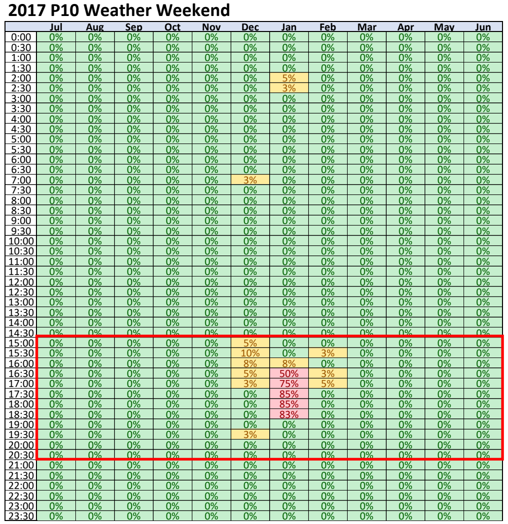
CAGR P10 Weekday



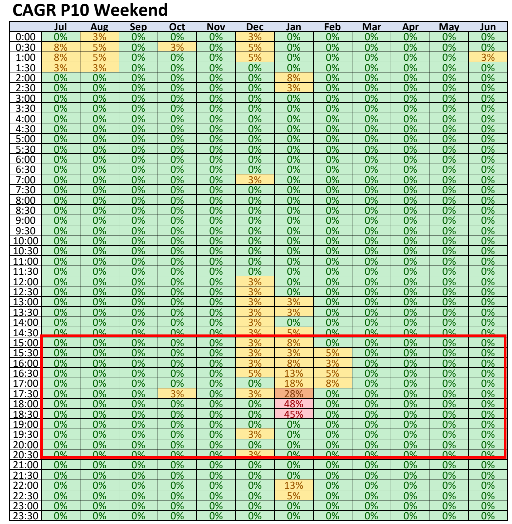
2017 Raw Weekend



2017 P10 Weather Weekend



CAGR P10 Weekend



- Analysis of AusNet's zone substation peak periods shows P10 and trending leading to a much smaller peak window
- *Energeia recommends red boxed peak periods in the CAGR P10 tables*

Source: Energeia

Retail Peak Periods – Final

Ausnet Retail CAGR P10 Weekday

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0	0	0	0	0	0	0	0	0	0	0	0
0:30	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0
1:30	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0
2:30	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0
4:30	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0	0	0	0
5:30	0	0	0	0	0	0	0	0	0	0	0	0
6:00	0	0	0	0	0	0	0	0	0	0	0	0
6:30	0	0	0	0	0	0	0	0	0	0	0	0
7:00	0	0	0	0	0	0	0	0	0	0	0	0
7:30	0	0	0	0	0	0	0	0	0	0	0	0
8:00	0	0	0	0	0	0	1	0	0	0	0	0
8:30	0	0	0	0	0	0	1	0	0	0	0	0
9:00	0	0	0	0	0	0	1	0	0	0	0	0
9:30	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	1	0	0	0	0	0	0
17:30	0	0	0	0	0	1	1	0	0	0	0	0
18:00	0	0	0	0	0	0	1	0	0	0	0	0
18:30	0	0	0	0	0	0	1	0	0	0	0	0
19:00	0	0	0	0	0	0	1	0	0	0	0	0
19:30	0	0	0	0	0	0	1	0	0	0	0	0
20:00	0	0	0	0	0	0	1	0	0	0	0	0
20:30	0	0	0	0	0	0	1	0	0	0	0	0
21:00	0	0	0	0	0	0	1	0	0	0	0	0
21:30	0	0	0	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0	0	0	0
22:30	0	0	0	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0	0	0	0
23:30	0	0	0	0	0	0	0	0	0	0	0	0

Citipower Retail CAGR P10 Weekday

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0	0	0	0	0	0	0	0	0	0	0	0
0:30	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0
1:30	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0
2:30	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0
4:30	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0	0	0	0
5:30	0	0	0	0	0	0	0	0	0	0	0	0
6:00	0	0	0	0	0	0	0	0	0	0	0	0
6:30	0	0	0	0	0	0	0	0	0	0	0	0
7:00	0	0	0	0	0	0	0	0	0	0	0	0
7:30	0	0	0	0	0	0	0	0	0	0	0	0
8:00	0	0	0	0	0	0	1	0	0	0	0	0
8:30	0	0	0	0	0	0	1	0	0	0	0	0
9:00	0	0	0	0	0	0	1	0	0	0	0	0
9:30	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	1	0	0	0	0	0
10:30	0	0	0	0	0	0	1	0	0	0	0	0
11:00	0	0	0	0	0	0	1	0	0	0	0	0
11:30	0	0	0	0	0	0	1	0	0	0	0	0
12:00	0	0	0	0	0	0	1	0	0	0	0	0
12:30	0	0	0	0	0	0	1	0	0	0	0	0
13:00	0	0	0	0	0	0	1	0	0	0	0	0
13:30	0	0	0	0	0	0	1	0	0	0	0	0
14:00	0	0	0	0	0	0	1	0	0	0	0	0
14:30	0	0	0	0	0	0	1	0	0	0	0	0
15:00	0	0	0	0	0	0	1	0	0	0	0	0
15:30	0	0	0	0	0	0	1	0	0	0	0	0
16:00	0	0	0	0	0	0	1	0	0	0	0	0
16:30	0	0	0	0	0	0	1	0	0	0	0	0
17:00	0	0	0	0	0	0	1	0	0	0	0	0
17:30	0	0	0	0	0	0	1	0	0	0	0	0
18:00	0	0	0	0	0	0	1	0	0	0	0	0
18:30	0	0	0	0	0	0	1	0	0	0	0	0
19:00	0	0	0	0	0	0	1	0	0	0	0	0
19:30	0	0	0	0	0	0	1	0	0	0	0	0
20:00	0	0	0	0	0	0	1	0	0	0	0	0
20:30	0	0	0	0	0	0	1	0	0	0	0	0
21:00	0	0	0	0	0	0	1	0	0	0	0	0
21:30	0	0	0	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0	0	0	0
22:30	0	0	0	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0	0	0	0
23:30	0	0	0	0	0	0	0	0	0	0	0	0

Jemena Retail CAGR P10 Weekday

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0	0	0	0	0	0	0	0	0	0	0	0
0:30	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0
1:30	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0
2:30	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0
4:30	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0	0	0	0
5:30	0	0	0	0	0	0	0	0	0	0	0	0
6:00	0	0	0	0	0	0	0	0	0	0	0	0
6:30	0	0	0	0	0	0	0	0	0	0	0	0
7:00	0	0	0	0	0	0	0	0	0	0	0	0
7:30	0	0	0	0	0	0	0	0	0	0	0	0
8:00	0	0	0	0	0	0	1	0	0	0	0	0
8:30	0	0	0	0	0	0	1	0	0	0	0	0
9:00	0	0	0	0	0	0	1	0	0	0	0	0
9:30	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	1	0	0	0	0
16:00	0	0	0	0	0	0	0	1	0	0	0	0
16:30	0	0	0	0	0	1	0	1	0	0	0	0
17:00	0	0	0	0	0	0	0	1	0	0	0	0
17:30	0	0	0	0	0	0	1	0	0	0	0	0
18:00	0	0	0	0	0	0	1	0	0	0	0	0
18:30	0	0	0	0	0	0	1	0	0	0	0	0
19:00	0	0	0	0	0	0	1	0	0	0	0	0
19:30	0	0	0	0	0	0	1	0	0	0	0	0
20:00	0	0	0	0	0	0	1	0	0	0	0	0
20:30	0	0	0	0	0	0	1	0	0	0	0	0
21:00	0	0	0	0	0	0	1	0	0	0	0	0
21:30	0	0	0	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0	0	0	0
22:30	0	0	0	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0	0	0	0
23:30	0	0	0	0	0	0	0	0	0	0	0	0

Powercor Retail CAGR P10 Weekday

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0	0	0	0	0	0	0	0	0	0	0	0
0:30	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0
1:30	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0
2:30	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0
4:30	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0	0	0	0
5:30	0	0	0	0	0	0	0	0	0	0	0	0
6:00	0	0	0	0	0	0	0	0	0	0	0	0
6:30	0	0	0	0	0	0	0	0	0	0	0	0
7:00	0	0	0	0	0	0	0	0	0	0	0	0
7:30	0	0	0	0	0	0	0	0	0	0	0	0
8:00	0	0	0	0	0	0	1	0	0	0	0	0
8:30	0	0	0	0	0	0	1	0	0	0	0	0
9:00	0	0	0	0	0	0	1	0	0	0	0	0
9:30	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	1	0	0	0	0	0
18:00	0	0	0	0	0	0	1	0	0	0	0	0
18:30	0	0	0	0	0	0	1	0	0	0	0	0
19:00	0	0	0	0	0	0	1	0	0	0	0	0
19:30	0	0	0	0	0	0	1	0	0	0	0	0
20:00	0	0	0	0	0	0	1	0	0	0	0	0
20:30	0	0	0	0	0	0	1	0	0	0	0	0
21:00	0	0	0	0	0	0	1	0	0	0	0	0
21:30	0	0	0	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0	0	0	0
22:30	0	0	0	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0	0	0	0
23:30	0	0	0	0	0	0	0	0	0	0	0	0

United Retail CAGR P10 Weekday

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0	0	0	0	0	0	0	0	0	0	0	0
0:30	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0
1:30	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0
2:30	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0
4:30	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0	0	0	0
5:30	0	0	0	0	0	0	0	0	0	0	0	0
6:00	0	0	0	0	0	0	0	0	0	0	0	0
6:30	0	0	0	0	0	0	0	0	0	0	0	0
7:00	0	0	0	0	0	0	0	0	0	0	0	0
7:30	0	0	0	0	0	0	0	0	0	0	0	0
8:00	0	0	0	0	0	0	1	0	0	0	0	0
8:30	0	0	0	0	0	0	1	0	0	0	0	0
9:00	0	0	0	0	0	0	1	0	0	0	0	0
9:30	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	1	0	0	0	0	0	0
16:30	0	0	0	0	0	1	0	0	0	0	0	0
17:00	0	0	0	0	0	1	0	0	0	0	0	0
17:30	0	0	0	0	0	0	1	0	0	0	0	0
18:00	0	0	0	0	0	0	1	0	0	0	0	0
18:30	0	0	0	0	0	0	1	0	0	0	0	0
19:00	0	0	0	0	0	0	1	0	0	0	0	0
19:30	0	0	0	0	0	0	1	0	0	0	0	0
20:00	0	0	0	0	0	0	1	0	0	0	0	0
20:30	0	0	0	0	0	0	1	0	0	0	0	0
21:00	0	0	0	0	0	0	1	0	0	0	0	0
21:30	0	0	0	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0	0	0	0
22:30	0	0	0	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0	0	0	0
23:30	0	0	0	0	0	0	0	0	0	0	0	0

Ausnet Retail CAGR P10 Weekend

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0	0	0	0	0	0	0	0	0	0	0	0
0:30	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0
1:30	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0
2:30	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0
4:30	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0	0	0	0
5:30	0	0	0	0	0	0	0	0	0	0	0	0
6:00	0	0	0	0	0	0	0	0	0	0	0	0
6:30	0	0	0	0	0	0	0	0	0	0	0	0
7:00	0	0	0	0	0	0	0	0	0	0	0	0
7:30	0	0	0	0	0	0	0	0	0	0	0	0
8:00	0	0	0	0	0	0	0	0	0	0	0	0
8:30	0	0	0	0	0	0	0	0	0	0	0	0
9:00	0	0	0	0	0	0	0	0	0	0	0	0
9:30	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	1	0	0	0	0	0
18:00	0	0	0	0	0	0	1	0	1	0	0	0
18:30	0	0	0	0	0	0	1	0	1	0	0	0
19:00	0	0	0	0	0	0	0	0	1	0	0	0
19:30	0	0	0	0	0	0	0	0	1	0	0	0
20:00	0	0	0	0	0	0	0	0	0	0	0	0
20:30	0	0	0	0	0	0	0	0	0	0	0	0
21:00	0	0	0	0	0	0	0	0	0	0	0	0
21:30	0	0	0	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0	0	0	0
22:30	0	0	0	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0	0	0	0
23:30	0	0	0	0	0	0	0	0	0	0	0	0

Citipower Retail CAGR P10 Weekend

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0	0	0	0	0	0	0	0	0	0	0	0
0:30	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0
1:30	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0
2:30	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0
4:30	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0	0	0	0
5:30	0	0	0	0	0	0	0	0	0	0	0	0
6:00	0	0	0	0	0	0	0	0	0	0	0	0
6:30	0	0	0	0	0	0	0	0	0	0	0	0
7:00	0	0	0	0	0	0	0	0	0	0	0	0
7:30	0	0	0	0	0	0	0	0	0	0	0	0
8:00	0	0	0	0	0	0	0	0	0	0	0	0
8:30	0	0	0	0	0	0	0	0	0	0	0	0
9:00	0	0	0	0	0	0	0	0	0	0	0	0
9:30	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	1	0	0	0
18:30	0	0	0	0	0	0	0	0	1	0	0	0
19:00	0	0	0	0	0	0	0	0	1	0	0	0
19:30	0	0	0	0	0	0	0	0	1	0	0	0
20:00	0	0	0	0	0	0	0	0	0	0	0	0
20:30	0	0	0	0	0	0	0	0	0	0	0	0
21:00	0	0	0	0	0	0	0	0	0	0	0	0
21:30	0	0	0	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0	0	0	0
22:30	0	0	0	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0	0	0	0
23:30	0	0	0	0	0	0	0	0	0	0	0	0

Jemena Retail CAGR P10 Weekend

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0	0	0	0	0	0	0	0	0	0	0	0
0:30	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0
1:30	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0
2:30	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0
4:30	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0	0	0	0
5:30	0	0	0	0	0	0	0	0	0	0	0	0
6:00	0	0	0	0	0	0	0	0	0	0	0	0
6:30	0	0	0	0	0	0	0	0	0	0	0	0
7:00	0	0	0	0	0	0	0	0	0	0	0	0
7:30	0	0	0	0	0	0	0	0	0	0	0	0
8:00	0	0	0	0	0	0	0	0	0	0	0	0
8:30	0	0	0	0	0	0	0	0	0	0	0	0
9:00	0	0	0	0	0	0	0	0	0	0	0	0
9:30	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	1	0	0	0
18:30	0	0	0	0	0	0	0	0	1	0	0	0
19:00	0	0	0	0	0	0	0	0	1	0	0	0
19:30	0	0	0	0	0	0	0	0	1	0	0	0
20:00	0	0	0	0	0	0	0	0	0	0	0	0
20:30	0	0	0	0	0	0	0	0	0	0	0	0
21:00	0	0	0	0	0	0	0	0	0	0	0	0
21:30	0	0	0	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0	0	0	0
22:30	0	0	0	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0	0	0	0
23:30	0	0	0	0	0	0	0	0	0	0	0	0

Powercor Retail CAGR P10 Weekend

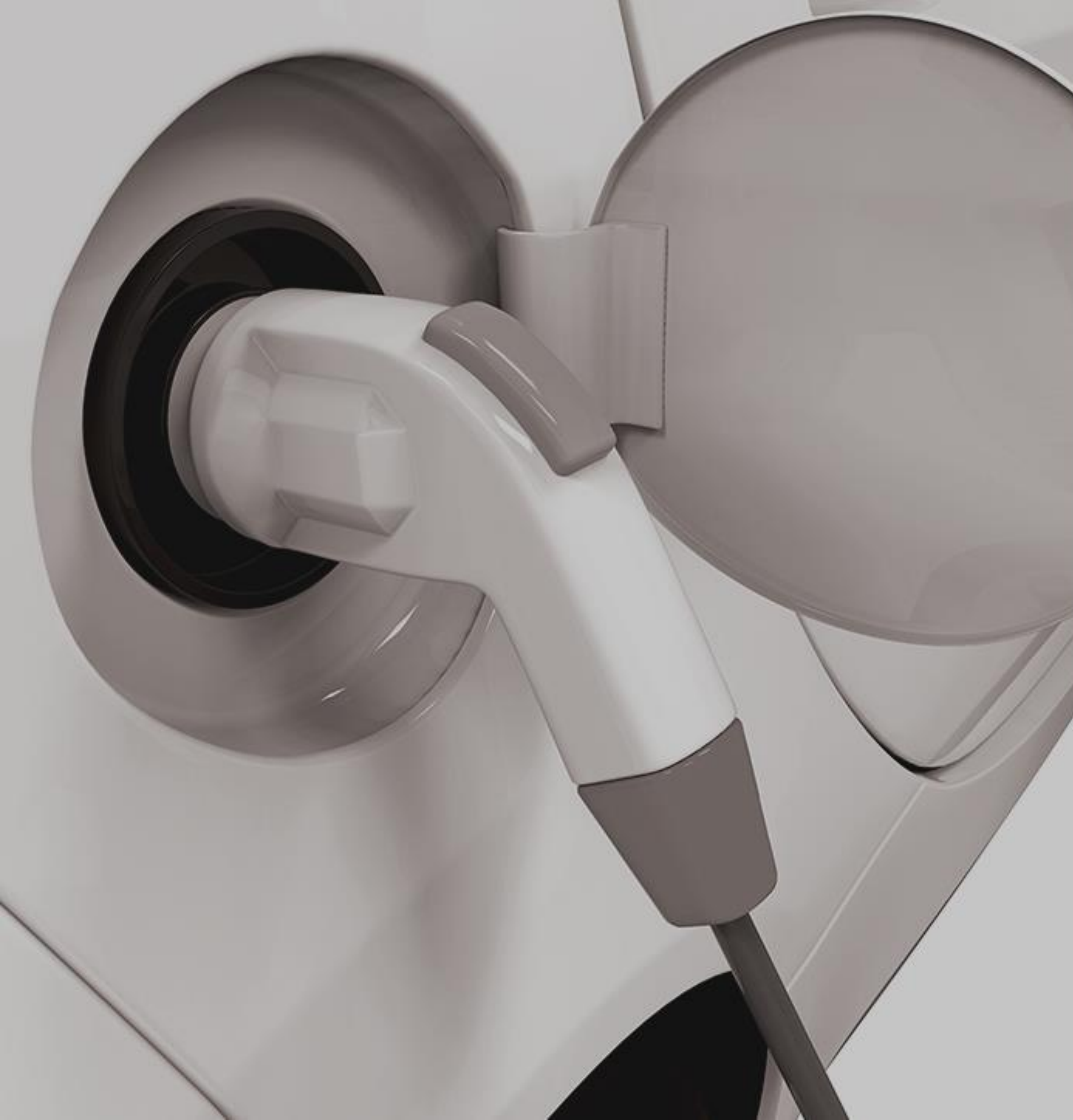
	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0	0	0	0	0	0	0	0	0	0	0	0
0:30	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0
1:30	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0
2:30	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0
4:30	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0	0	0	0
5:30	0	0	0	0	0	0	0	0	0	0	0	0
6:00	0	0	0	0	0	0	0	0	0	0	0	0
6:30	0	0	0	0	0	0	0	0	0	0	0	0
7:00	0	0	0	0	0	0	0	0	0	0	0	0
7:30	0	0	0	0	0	0	0	0	0	0	0	0
8:00	0	0	0	0	0	0	0	0	0	0	0	0
8:30	0	0	0	0	0	0	0	0	0	0	0	0
9:00	0	0	0	0	0	0	0	0	0	0	0	0
9:30	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	1	0	0	0
18:30	0	0	0	0	0	0	0	0	1	0	0	0
19:00	0	0	0	0	0	0	0	0	1	0	0	0
19:30	0	0	0	0	0	0	0	0	1	0	0	0
20:00	0	0	0	0	0	0	0	0	0	0	0	0
20:30	0	0	0	0	0	0	0	0	0	0	0	0
21:00	0	0	0	0	0	0	0	0	0	0	0	0
21:30	0	0	0	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0	0	0	0
22:30	0	0	0	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0	0	0	0
23:30	0	0	0	0	0	0	0	0	0	0	0	0

United Retail CAGR P10 Weekend

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0	0	0	0	0	0	0	0	0	0	0	0
0:30	0	0	0	0	0	0	0	0	0	0	0	0
1:00	0	0	0	0	0	0	0	0	0	0	0	0
1:30	0	0	0	0	0	0	0	0	0	0	0	0
2:00	0	0	0	0	0	0	0	0	0	0	0	0
2:30	0	0	0	0	0	0	0	0	0	0	0	0
3:00	0	0	0	0	0	0	0	0	0	0	0	0
3:30	0	0	0	0	0	0	0	0	0	0	0	0
4:00	0	0	0	0	0	0	0	0	0	0	0	0
4:30	0	0	0	0	0	0	0	0	0	0	0	0
5:00	0	0	0	0	0	0	0	0	0	0	0	0
5:30	0	0	0	0	0	0	0	0	0	0	0	0
6:00	0	0	0	0	0	0	0	0	0	0	0	0
6:30	0	0	0	0	0	0	0	0	0	0	0	0
7:00	0	0	0	0	0	0	0	0	0	0	0	0
7:30	0	0	0	0	0	0	0	0	0	0	0	0
8:00	0	0	0	0	0	0	0	0	0	0	0	0
8:30	0	0	0	0	0	0	0	0	0	0	0	0
9:00	0	0	0	0	0	0	0	0	0	0	0	0
9:30	0	0	0	0	0	0	0	0	0	0	0	0
10:00	0	0	0	0	0	0	0	0	0	0	0	0
10:30	0	0	0	0	0	0	0	0	0	0	0	0
11:00	0	0	0	0	0	0	0	0	0	0	0	0
11:30	0	0	0	0	0	0	0	0	0	0	0	0
12:00	0	0	0	0	0	0	0	0	0	0	0	0
12:30	0	0	0	0	0	0	0	0	0	0	0	0
13:00	0	0	0	0	0	0	0	0	0	0	0	0
13:30	0	0	0	0	0	0	0	0	0	0	0	0
14:00	0	0	0	0	0	0	0	0	0	0	0	0
14:30	0	0	0	0	0	0	0	0	0	0	0	0
15:00	0	0	0	0	0	0	0	0	0	0	0	0
15:30	0	0	0	0	0	0	0	0	0	0	0	0
16:00	0	0	0	0	0	0	0	0	0	0	0	0
16:30	0	0	0	0	0	0	0	0	0	0	0	0
17:00	0	0	0	0	0	0	0	0	0	0	0	0
17:30	0	0	0	0	0	0	0	0	0	0	0	0
18:00	0	0	0	0	0	0	0	0	1	0	0	0
18:30	0	0	0	0	0	0	0	0	1	0	0	0
19:00	0	0	0	0	0	0	0	0	1	0	0	0
19:30	0	0	0	0	0	0	0	0	1	0	0	0
20:00	0	0	0	0	0	0	0	0	0	0	0	0
20:30	0	0	0	0	0	0	0	0	0	0	0	0
21:00	0	0	0	0	0	0	0	0	0	0	0	0
21:30	0	0	0	0	0	0	0	0	0	0	0	0
22:00	0	0	0	0	0	0	0	0	0	0	0	0
22:30	0	0	0	0	0	0	0	0	0	0	0	0
23:00	0	0	0	0	0	0	0	0	0	0	0	0
23:30	0	0	0	0	0	0	0	0	0	0	0	0

Source: Energeia

ENERGEIA



Appendix 2

United Deep Dive

ENERGEIA

DNSP Peak Periods (United) – Deep Dive

United 3-Year CAGR P10 Weekday

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
9:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
10:00	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
10:30	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
11:00	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
11:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
12:30	0%	0%	0%	0%	2%	0%	2%	2%	0%	0%	0%	0%
13:00	0%	0%	0%	0%	2%	2%	7%	7%	0%	0%	0%	0%
13:30	0%	0%	0%	0%	10%	5%	10%	7%	0%	0%	0%	0%
14:00	0%	0%	0%	0%	10%	2%	2%	2%	0%	0%	0%	0%
14:30	0%	0%	0%	0%	12%	5%	0%	5%	0%	0%	0%	0%
15:00	0%	0%	0%	0%	12%	26%	0%	10%	0%	0%	0%	0%
15:30	0%	0%	0%	0%	10%	31%	0%	17%	0%	0%	0%	0%
16:00	0%	0%	0%	0%	10%	52%	0%	19%	0%	0%	0%	0%
16:30	0%	0%	0%	0%	12%	57%	0%	17%	0%	0%	0%	0%
17:00	0%	0%	0%	0%	5%	57%	0%	24%	0%	0%	0%	0%
17:30	0%	0%	0%	0%	0%	36%	0%	19%	0%	0%	0%	0%
18:00	0%	0%	0%	0%	0%	31%	5%	10%	0%	0%	0%	0%
18:30	0%	0%	0%	0%	0%	10%	10%	14%	0%	0%	0%	0%
19:00	0%	0%	0%	0%	0%	5%	12%	5%	0%	0%	0%	0%
19:30	0%	0%	0%	0%	0%	2%	10%	2%	0%	0%	0%	0%
20:00	0%	0%	0%	0%	0%	0%	10%	0%	0%	0%	0%	0%
20:30	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

United 5-Year CAGR P10 Weekday

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
2:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
3:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
5:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
8:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%
8:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	2%
9:00	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
9:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	2%	0%
10:00	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%	0%	2%
10:30	0%	0%	0%	0%	0%	0%	5%	0%	5%	0%	0%	0%
11:00	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
11:30	0%	0%	0%	0%	0%	0%	0%	0%	5%	0%	0%	0%
12:00	0%	0%	0%	0%	0%	0%	5%	2%	10%	0%	0%	0%
12:30	0%	0%	0%	0%	0%	0%	7%	2%	17%	0%	0%	0%
13:00	0%	0%	0%	0%	0%	0%	2%	2%	0%	0%	0%	0%
13:30	0%	0%	0%	0%	0%	2%	0%	2%	0%	0%	0%	0%
14:00	0%	0%	0%	0%	5%	0%	0%	2%	0%	0%	0%	0%
14:30	0%	0%	0%	0%	0%	0%	12%	5%	0%	0%	0%	0%
15:00	0%	0%	0%	0%	10%	12%	5%	5%	0%	0%	0%	0%
15:30	0%	0%	0%	0%	12%	19%	7%	12%	0%	0%	0%	0%
16:00	0%	0%	0%	0%	21%	24%	7%	17%	0%	0%	0%	0%
16:30	0%	0%	0%	0%	24%	29%	12%	40%	0%	0%	0%	0%
17:00	0%	0%	0%	0%	12%	33%	14%	57%	0%	0%	0%	0%
17:30	0%	0%	0%	0%	7%	36%	24%	29%	0%	0%	2%	0%
18:00	0%	0%	0%	0%	0%	36%	10%	17%	0%	0%	0%	0%
18:30	0%	0%	0%	0%	0%	31%	14%	7%	0%	0%	0%	0%
19:00	0%	0%	0%	0%	0%	19%	10%	2%	0%	0%	2%	0%
19:30	0%	0%	0%	0%	0%	12%	12%	0%	0%	0%	2%	0%
20:00	0%	0%	0%	0%	0%	7%	10%	0%	0%	0%	2%	0%
20:30	0%	0%	0%	0%	0%	0%	2%	0%	0%	0%	0%	0%
21:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
21:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
22:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

United 3-Year CAGR P10 Weekend

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
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3:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
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4:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
4:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
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6:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
6:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
7:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
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23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

United 5-Year CAGR P10 Weekend

	Jul	Aug	Sep	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun
0:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
0:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
1:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
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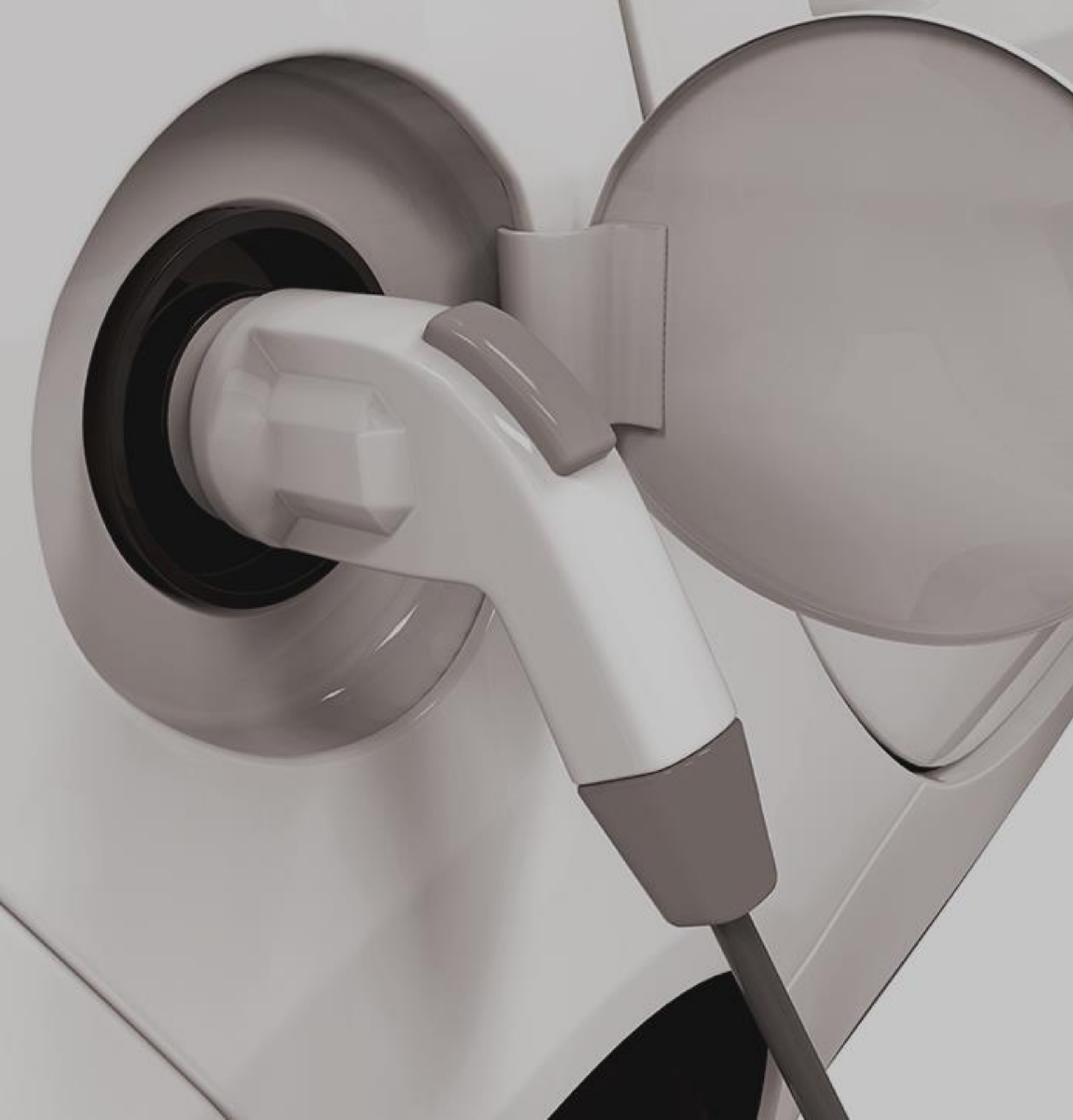
23:00	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
23:30	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%

Source: Energeia

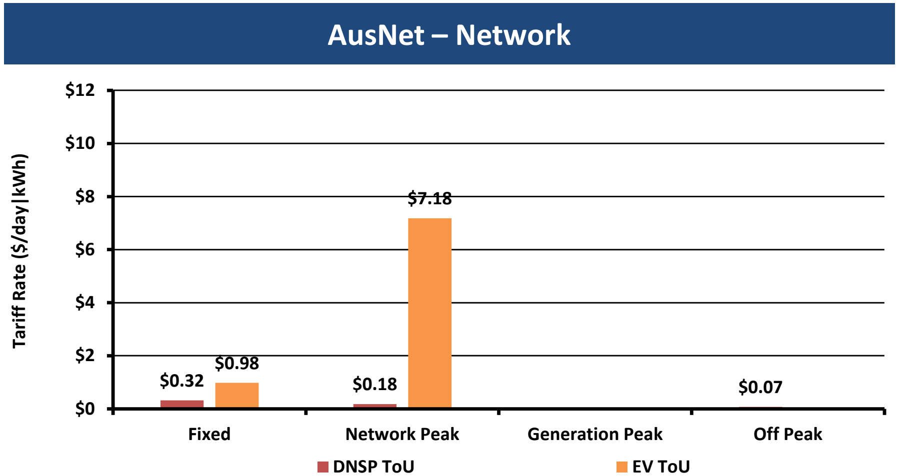
- Energeia tested the effect of using 5-years of historical ZS load profile data compared to 3-years
- Results shows the peak period changing, so it is worth considering which is more appropriate
- The key is whether the 3-year or 5-year trend is more significant over the next 5 years



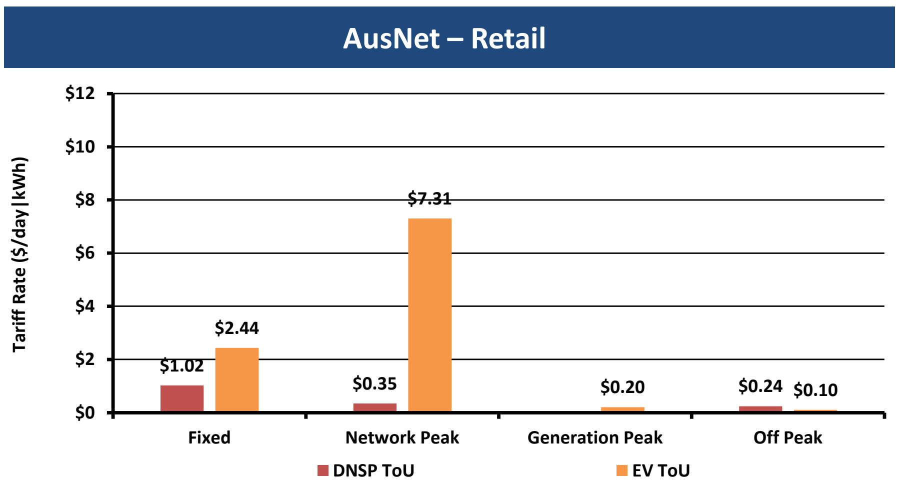
Appendix 3

DNSP ToU vs. EV ToU Rates

ToU Tariff Rates Comparison – AusNet



Source: Energeia



Source: Energeia

- The forthcoming slides will all show the following at the retail pricing level:
  - 2-5 fold increase in daily fixed charges
  - 50-60% decrease in off-peak kWh charges
  - 5-40 fold increase in peak price
- The fixed charged will be based on 3 consumption categories, enable a lower fixed charge for smaller customers
- Network pricing differentials are similar, however, it is worth noting that off-peak prices are zero

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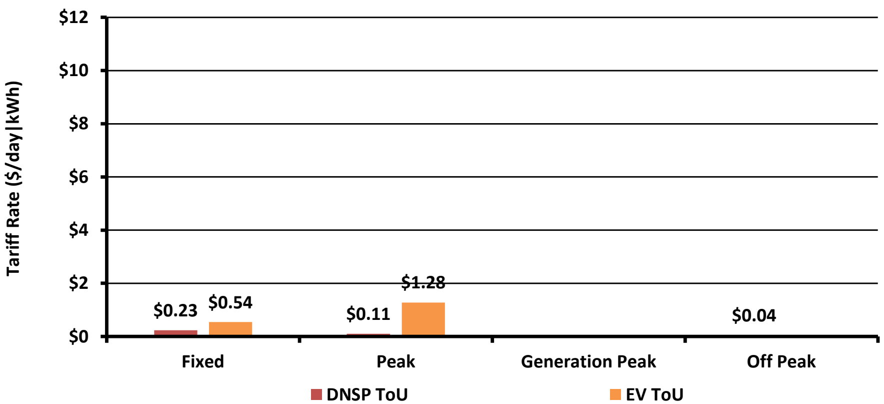
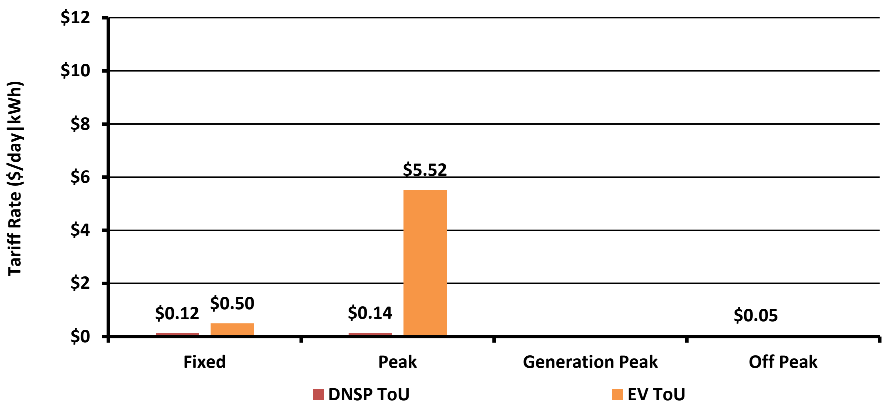
ToU Tariff Rates Comparison – CitiPower and Jemena

CitiPower – Network



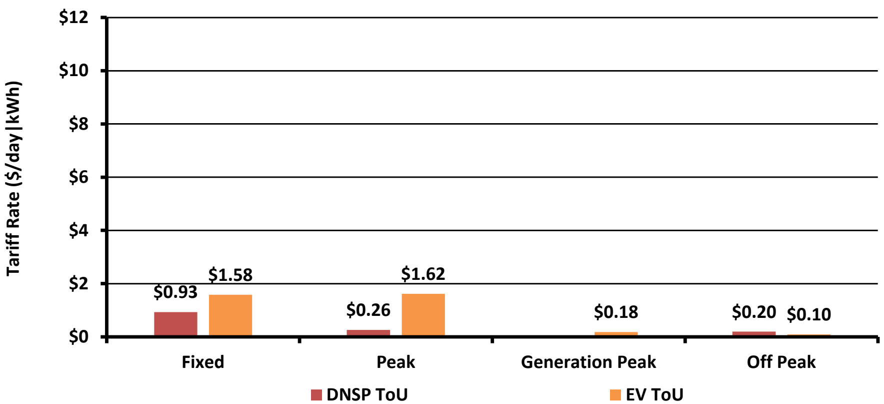
Source: Energeia

Jemena – Network



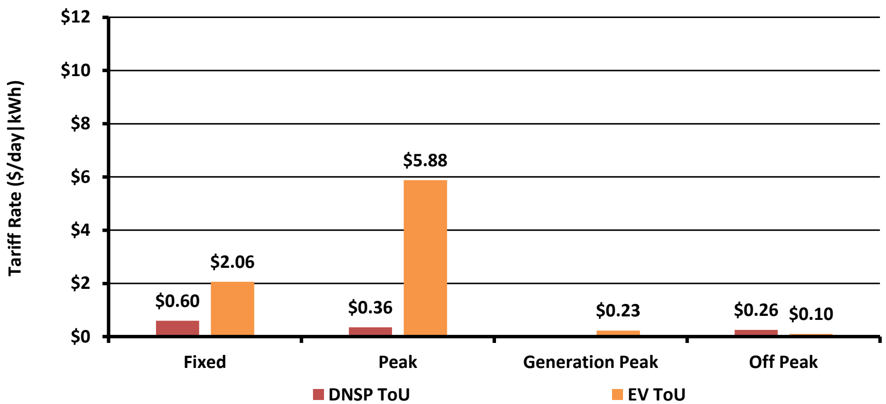
Source: Energeia

CitiPower – Retail



Source: Energeia

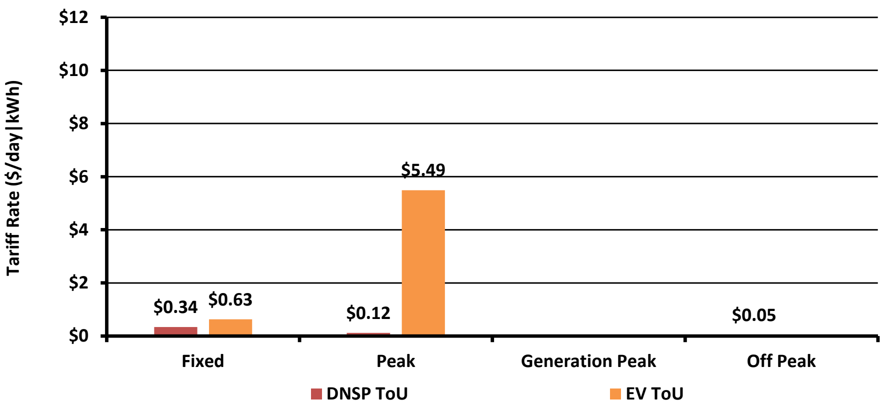
Jemena – Retail



Source: Energeia

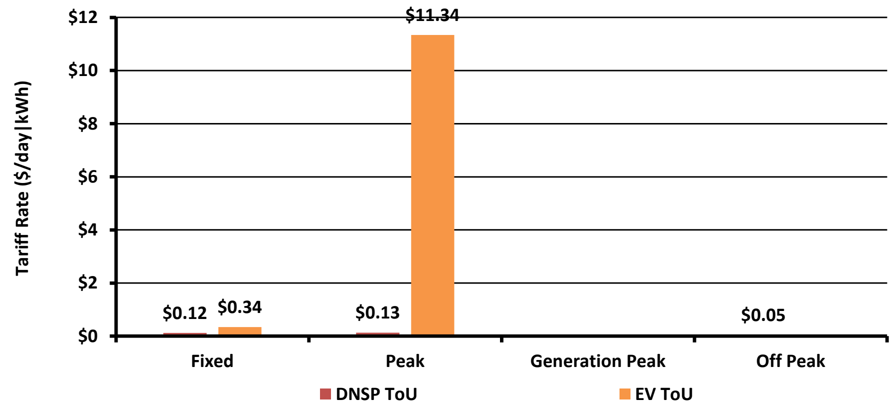
ToU Tariff Rates Comparison – Powercor & United

Powercor – Network



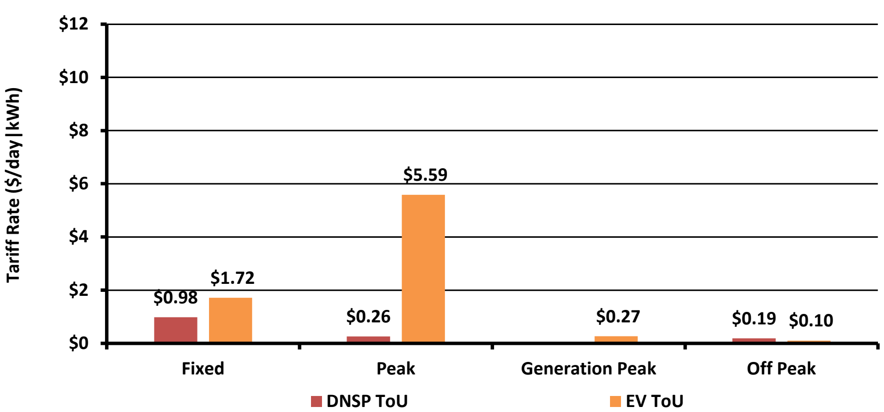
Source: Energeia

United – Network



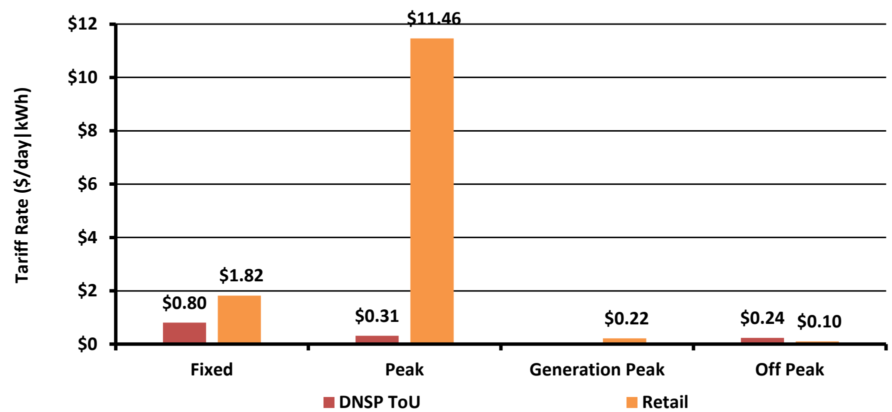
Source

Powercor – Retail



Source: Energeia

United – Retail



Source: Energeia

Appendix 4

DNSP ToU vs. EV ToU Network Cross-Subsidies

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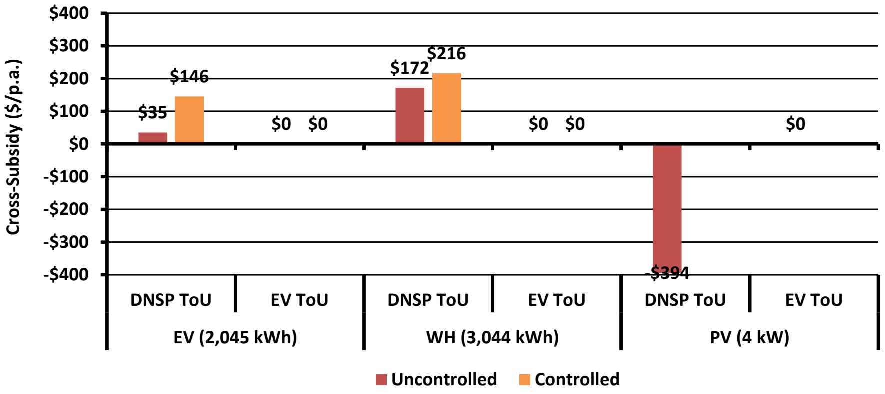
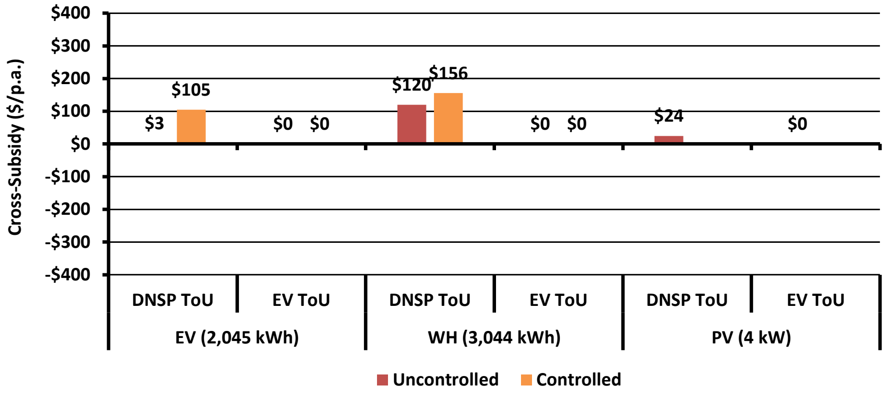
Cross-Subsidies – AusNet, CitiPower and Jemena

Ausnet



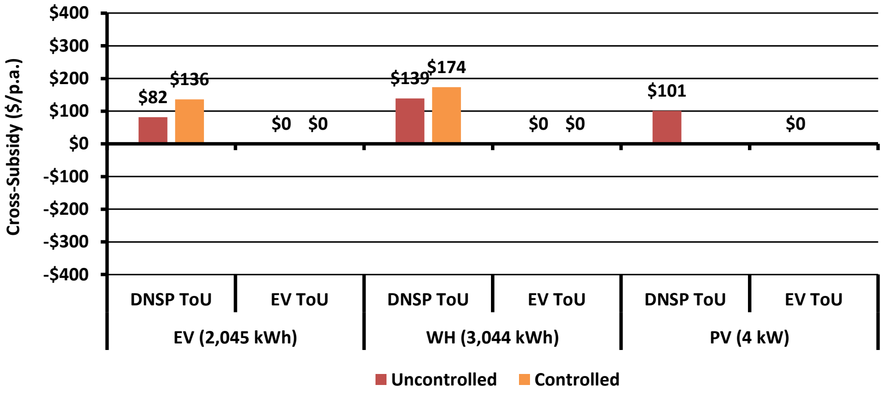
Source: Energeia

Jemena



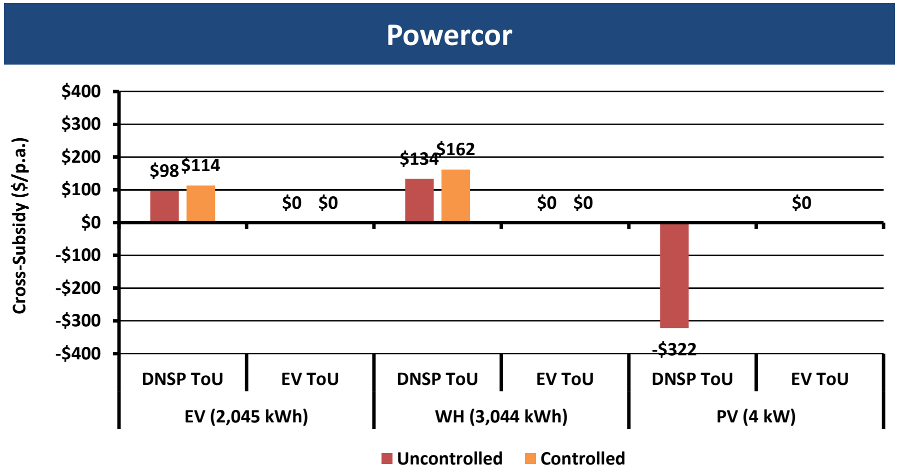
Source: Energeia

CitiPower

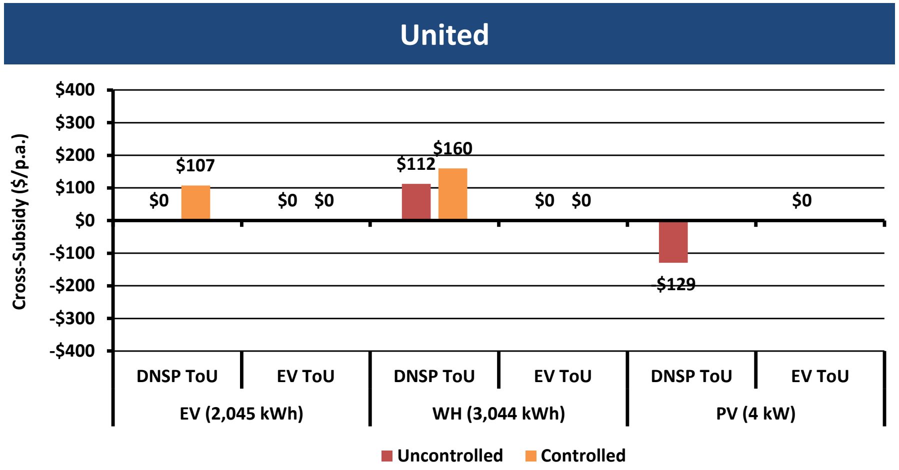


Source: Energeia

Cross-Subsidies – Powercor and United



Source: Energeia



Source: Energeia

- Interestingly, cross subsidies vary considerably across DNSPs
- In the case of Jemena and CitiPower, consumers adopting these technologies are paying more than their estimated cost of service
- In the other networks, EVs and water heating loads are being overcharged, while PV is being undercharged

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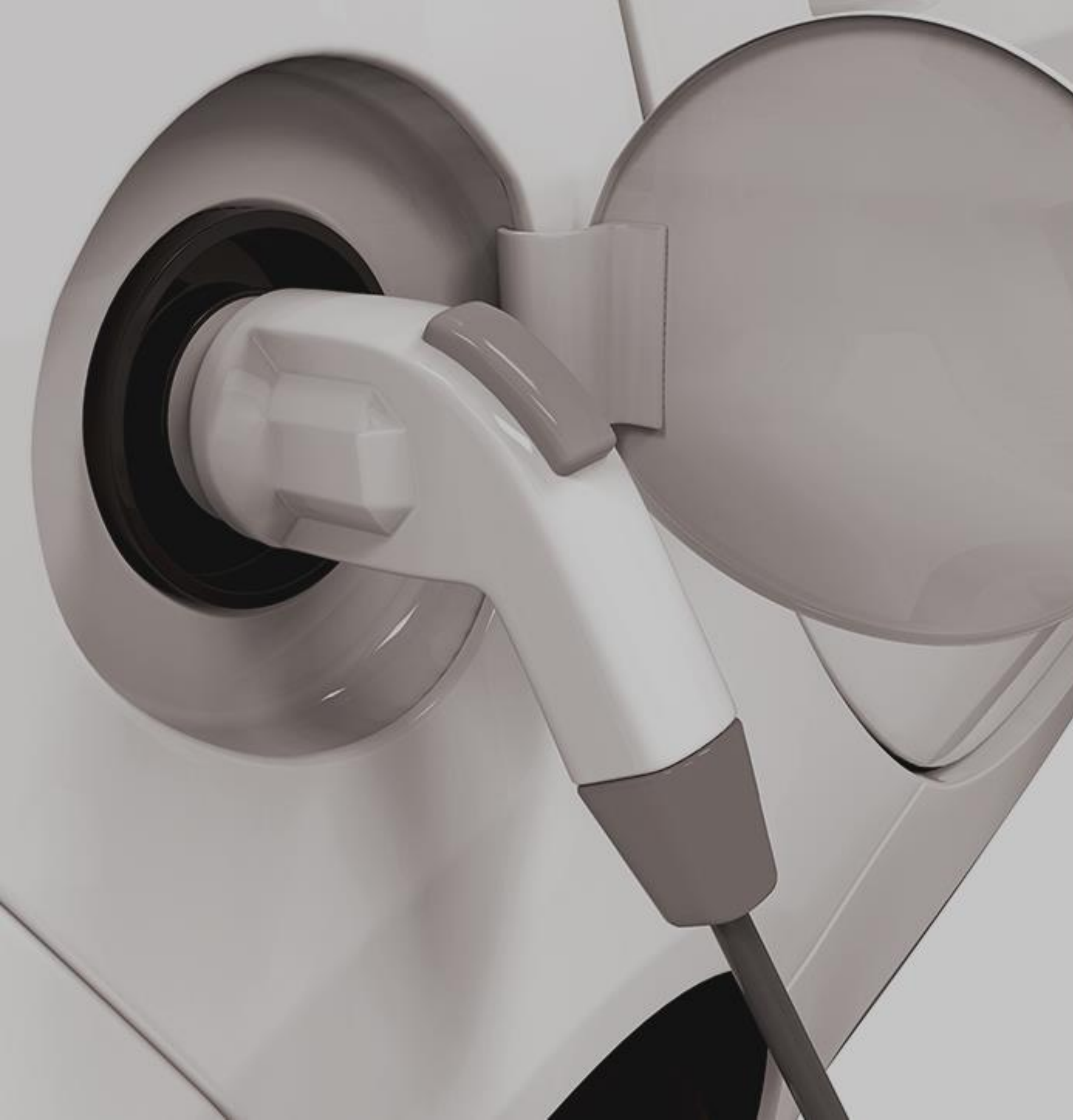

Appendix 5

Load Profile Assumptions

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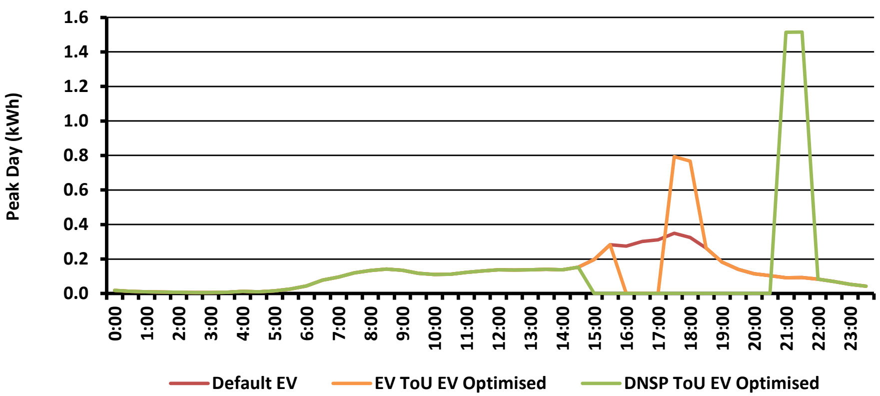
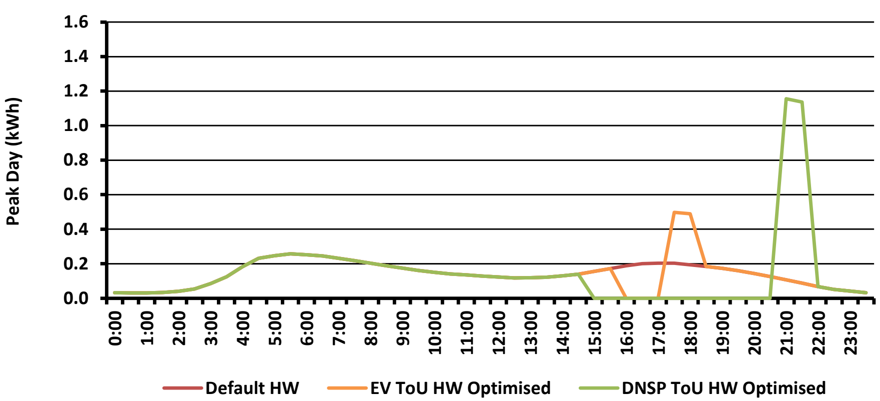
Peak Day Loads

Network Peak Day Optimal EV Charging (United)



Source: Energeia

Network Peak Day Optimal HW Usage (United)



Source: Energeia

- On a network peak day, the EV and HW sub-loads are optimised by shifting load out of the peak and towards the off-peak
- A large-spike can be observed after the peak time, where customers are immediately able to charge their vehicles at the lowest rate, see next slide
- This varies by the individual DNSPs calculated peak periods

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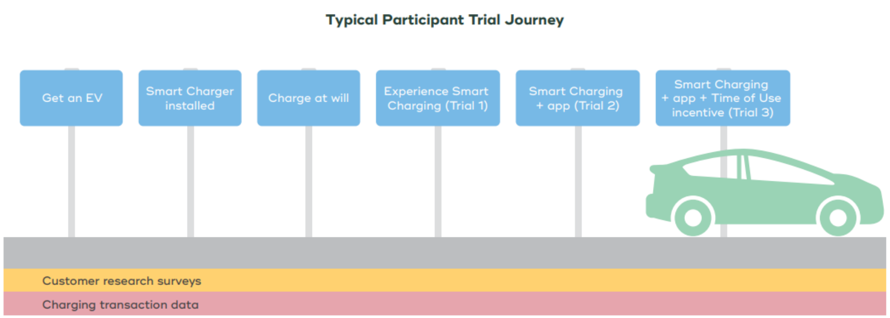
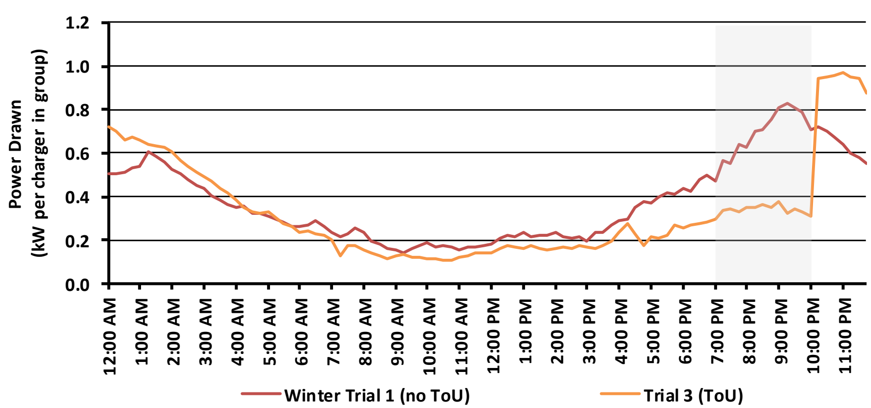
Charging Behaviour – UK Case Study

Electric Nation Pilot



Source: Electric Nation (2019)

Impact of ToU Incentives on Weekdays

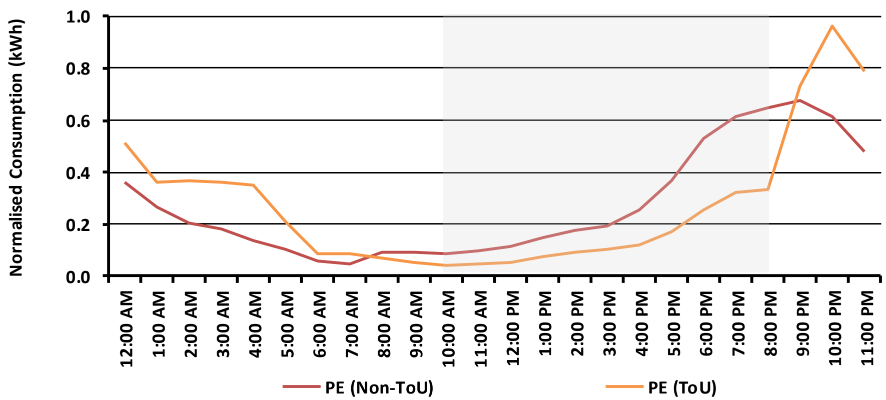


Source: Electric Nation (2019). Note: Grey shaded area is the peak period.

- A recent UK pilot, Electric Nation, funded by Western Power Distribution trialed domestic EV charging between January 2017 and December 2018:
  - **Trial 1** – Customers charge their EV with the distribution network managing their charging
  - **Trial 2** – Customers could manage their EV charging with an app
  - **Trial 3** – Customers were then provided a ToU-like incentive to EV charging
- Customers were found to shift their charging to off-peak periods when on a ToU tariff, eliminating the need for networks to manage customer charging behaviour
- ToU incentives were highly effective in shifting demand away from evening peak periods, especially with an app that makes it simpler for customers to optimize their charging and minimize their cost
- Study found that sharp demand spikes during off-peak periods may need to be managed, either through demand management or through implementing smart charging technology

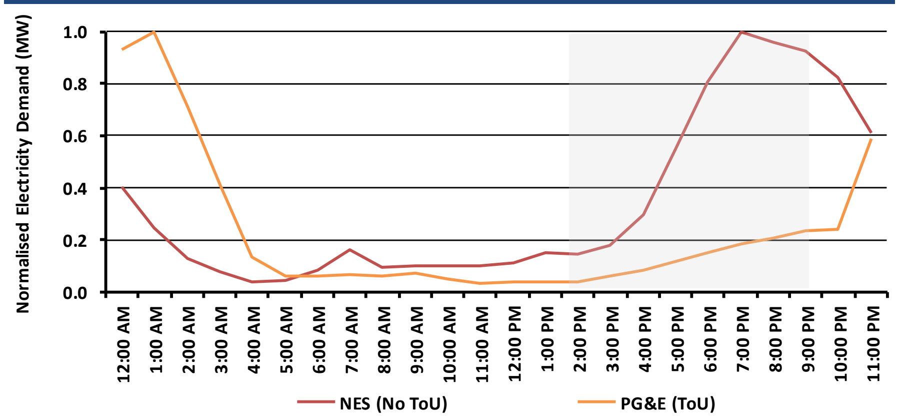
Charging Behaviour – US Case Studies

Summer Weekday Charging (NC and SC)



Source: US Department of Energy (2014). Note: Grey shaded area is the peak period.

Weekday Charging (TX and CA)



Source: National Research Council (2015) 'Overcoming Barriers to Deployment of Plug-in Electric Vehicles'. Note: Grey shaded area is the peak period for PG&E.

- Two US studies were found that specifically examined the impact of EV tariff design on customer charging patterns:
  - A 2014 study paid for by the US Department of Energy found customers on a ToU tariff shifted their charging outside of the peak period compared to those not on a ToU tariff
  - A 2015 study paid for by the US National Research Council found a similar result
- Both studies therefore confirmed that EV drivers shift charging patterns in response to price signals
- However, demand spikes immediately following the peak period are observable
- These findings are consistent with the Australian Federal Government funded, *Smart Grid, Smart City* project

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CA = California; NC = North Carolina; NES = Nashville Electric Service; PE = Progress Energy; PG&E = Pacific Gas and Electric; SC = South Carolina; ToU = Time-of-Use; TX = Texas