MORE SUN FOR EVERYONE

DISTRIBUTED ENERGY RESOURCES RULE CHANGE

Submission to Australian Energy Market Commission

7 July 2020

Important: This rule change does not force solar owners to pay to export to the grid

(in fact it creates opportunities for them to export more to the grid)

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A. RULE CHANGE PROPONENTS

Total Environment Centre (TEC), 2/99 Devonshire St Surry Hills NSW 2010.

TEC (www.tec.org.au) has been involved in National Electricity Market (NEM) advocacy since 2004, arguing above all for greater utilisation of demand side participation—energy conservation and efficiency, demand response/management and decentralised generation—to meet Australia's electricity needs. By reforming the NEM we are working to contribute to climate change mitigation and improve other environmental outcomes of Australia's energy sector, while also constraining retail prices and improving the economic efficiency of the NEM—all in the long term interest of consumers. TEC has initiated four other rule change requests. Our energy market reform work is funded by Energy Consumers Australia.

Australian Council of Social Service (ACOSS), Level 3, 219-241 Cleveland St, Strawberry Hills NSW 2012.

ACOSS (https://www.acoss.org.au) is a national peak body supporting people affected by poverty, disadvantage and inequality, and the peak council for community services nationally. ACOSS has been active since 2006 as an advocate on behalf of low income and disadvantaged people in development and reform of the national energy market and non-energy market measures.

B. SUMMARY OF RULE CHANGE

Brief description

This rule change submitted by TEC and ACOSS is intended as a first step to creating a fit for purpose regulatory framework for the shift to a two-way energy system created by increasingly more distributed energy resources (DER) in the National Energy Market (NEM). The changes to the regulatory framework will support greater investment in and better operation of DER to facilitate faster decarbonisation of the energy system and deliver more equitable and efficient outcomes for all energy users. It does this by creating obligations and incentives for networks to optimise existing, or invest in additional, DER hosting capacity, while also improving access to the grid for prosumers (ie, consumers who also produce energy).

Why these reforms are needed

Consumer DER such as rooftop solar, batteries and electric vehicles are a key part of the future energy system. They can help accelerate the decarbonisation of the grid, improve grid reliability and make energy more affordable for everyone. The rapid uptake of DER means we are moving towards a two-way electricity grid in which people consume, generate, export and trade energy.

But the two decades old National Electricity Rules (NER or the rules) are stuck in the outdated one-way system, with several consequences:

- Current pricing arrangements result in investment in and deployment of DER that is not economically efficient.
- Technical issues will increasingly act as a handbrake on the decarbonisation of the energy system due to the increasing practice of limiting rooftop solar exports.
- Equity issues are arising, especially because people without DER are paying a higher proportion of the costs of the grid that everyone depends upon.

Objective

In response to these challenges, the objective of *More Sun for Everyone* is to create a regulatory regime that efficiently and equitably optimises the expanding role of DER exports to support a rapid, fair and affordable transition to a zero net carbon energy system.

The rule change proposes a series of incremental reforms towards this long-term objective, focusing on two dimensions related to DER exports:

- **Planning and investment**: Make the best use of existing DER hosting capacity and encourage efficient network investment in new DER hosting capacity.
- **Access:** Allow choices for prosumers to increase their export capacity in return for a guaranteed level of service, and ensure the equitable distribution of hosting capacity between prosumers.

A third dimension, **pricing**, may be dealt with via a subsequent rule change process, which would aim to introduce symmetrical or two-way import and export pricing. As discussed in section E, introducing pricing reform would be subject to a number of conditions and the outcomes of a number of other reform processes, and, if progressed, would not be implemented until 2029. Our initial thinking of what a more far-reaching reform could look like is outlined in the appendix.

It is critical to note that this rule change would not result in solar owners been charged to export to the grid (except if they *choose* this option in return for greater export capacity).

What could happen without these reforms

If this rule change is not implemented, over time the following are likely:

- More prosumers will be export limited or subject to zero exports, leading to inefficient investment in DER and reducing the amount of zero emissions energy suppled to the grid.
- Prosumers will have their systems shut off more often to prevent overvoltage, preventing even self-consumption.
- The inequities between early and late adopters of rooftop photovoltaic (PV) will become exacerbated.
- Other consumers will be forced to bear the increasing costs of managing DER integration, even in circumstances where there is no net public benefit.[1]

C. CONTEXT

Research and consultation

This rule change request is a response to the DER regulatory reform imperatives highlighted in the Australian Energy Market Commission's (AEMC's) 2018 and 2019 Economic regulatory framework reviews (ENERF),[2] as well as discussion papers from TEC and Renew in 2018[3] and St Vincent de Paul Society in 2019.[4]

In particular, it is a response to the challenge put by AEMC Chair John Pierce in 2019:

> Regulation should be centred on outcomes that maximise benefits to all consumers, and designed to promote innovation and competition. Consumers should be rewarded for integrating their behind the meter appliances with the network. We think reforms to regulation are necessary to make this a reality, particularly to the way electricity 'exports' and 'imports' are priced, and to allow for different access and connection services to be provided by network distribution businesses. Through the… [Distributed Energy Integration Program], the Commission will work closely with stakeholders who intend to submit rule change requests to progress reforms to distribution access, connections and charging arrangements.[5]

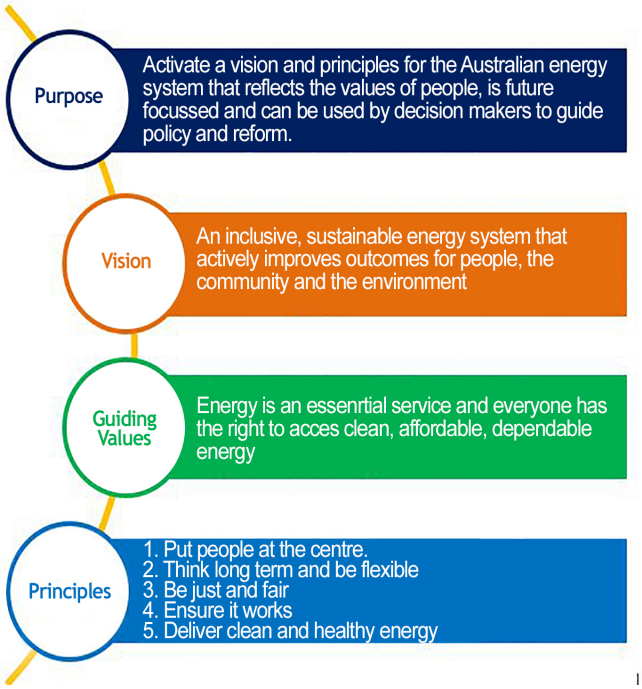
[1] Assuming that networks are required to make these investments but continue to charge as at present.
[2] AEMC, Integrating distributed energy resources for the grid of the future, Economic regulatory framework review, 2019: https://www.aemc.gov.au/market-reviews-advice/electricity-network-economic-regulatory-framework-review-2019.
[3] TEC and Renew, Cross about subsidies: the equity implications of rooftop solar in Australia, 2018.
[4] SVDP, Options for an equitable Distributed Energy Resource future, 2019.
[5] AEMC, Integrating distributed energy resources for the grid of the future, Economic regulatory framework review, 2019, I.

The rule change has been informed by the outcomes of a nine month consultation process undertaken by the Distributed Energy Integration Program (DEIP) Access and Pricing work package undertaken by ACOSS, Australian Energy Market Commission (AEMC), Australian Renewable Energy Agency (ARENA), Australian Energy Regulator (AER), Energy Consumers Australia (ECA), Energy Networks Australia (ENA), Public Interest Advocacy Centre (PIAC) and TEC.[6]

The DEIP Access and Pricing work package included several multi-stakeholder workshops, with input from a commissioned consultant (CEPA) report[7] and engagement with a wider Reference Group, culminating in the publication of an Outcomes Report.[8]

It has also been informed by the 2019-2020 Oakley Greenwood reports for ARENA[9] and is intended to be consistent with the vision and principles of the New Energy Compact (see figure 1).[10]

Figure 1 New Energy Compact



Rule change not the only solution

It should also be noted that this rule change is only part of the DEIP access and pricing reform package (detailed in the Outcomes report), which also includes:

- Updating network service definitions, standards and obligations (including for smart inverters and smart metering);
- Reforms to support ongoing innovation and investment in platforms and technologies which maintain DER operations within network technical limits;
- Acceleration of the transition towards cost-reflective consumption tariffs in ways that addresses broad community concerns; and
- Acceleration of the roll out of smart metering and other complementary technologies as key enablers to ongoing tariff reform and to support communications and measurement in a two-way power system.

In other words, this rule change request should not be seen as a comprehensive solution to the challenges and opportunities of a high DER energy system. Rather, it is one piece of the puzzle.

It should also be considered within the context of the other regulatory reforms including further developments through the Energy Security Board's (ESB's) DER Technical Integration work plan and Two-sided

[6] We note the rule change does not necessarily reflect the views of all members of the DEIP Access and Pricing Working Group or Reference Group members

[7] CEPA, Distributed Energy Resources Integration Program – Access and pricing Reform options, for AEMC, 2020.

8 See DEIP Access & Pricing Reform Package - Recommendations Report, 2020. These rule changes do not necessarily reflect the views of all members of the working or reference groups.

[9] See OGW, DER Price Signals: 'Fit' with Market Rules, International Experience and Cost-Benefit Assessment, for ARENA, 2020, and https://arena.gov.au/projects/pricing-and-integration-of-distributed-energy-resources-study.

[10] The NEC is a people centred vision for the Australian energy system and is an initiative of ACOSS, TEC and ECA: see https://www.acoss.org.au/new-energy-compact.

Market and Post 2025 Market Design reviews. Further, it is intended to complement the move to a more dynamic pricing regime for transmission connected generators (the COGATI process). [11]

More Sun for Everyone *rule change necessary*

There are other incremental reforms underway, such as the introduction of demand and other cost reflective network consumption tariffs. These tariffs will go some way towards ameliorating the technical and equity issues associated with high DER exports by incentivising energy flows at times of the day that reduce costs on the network (by reducing consumption and encourage exports during peak periods).

However, the effectiveness of consumption tariff reform shrinks with the increasing penetration of batteries and electric vehicles. These allow a high degree of independence from the grid, and therefore from paying network costs, even during the evening peak periods (when solar and non-solar households typically have similar peak demand). The limited capacity of many households to shift load from evenings to the solar trough also means that, as solar penetration increases, so do the challenges associated with enabling its export to the grid.

We therefore consider that the consumption tariff reforms already underway are not sufficient to enable an efficient and fair high DER future system.

D. SUMMARY OF ISSUE

DER provides benefits

Investment by households and businesses in DER such as solar PV, batteries, electric vehicles and smart appliances is rapidly changing the way Australia produces, consumes and manages electricity. DER technologies provide benefits and opportunities for all energy users, including lower bills, greater control and flexibility, and assisting the urgent need to move towards a zero net carbon energy system.

> Distributed] PV generation already exceeds the largest scheduled generator in the NEM today. There is already 9 GW of rooftop solar installed in the NEM today; by 2025, this is projected to increase to 12 GW in the Central scenario and 19 GW in the Step Change scenario.[12]

According to AEMO, DER could account for nearly one quarter of all generation capacity in the NEM by 2040, resulting in potential savings to consumers of around $1 billion as well as significant reductions in carbon emissions.[13] A more recent CSIRO modelling update for AEMO projects combined residential and commercial rooftop PV capacity of up to 60 GW by 2050 – a massive increase of up to 700 per cent on the capacity in 2020.[14]

DER growth is creating challenges

There are a number of challenges emerging as a result of the growth of DER under the current rules, which are constraining their benefits. For example, the AER State of the Energy Market 2020 states:

> Investment in DER by energy customers poses challenges to the power system, in terms of DER's lack of visibility, and variations in controllability and level of performance. If integrated efficiently, DER has a flexible nature that can help delay the need for large scale generation and network investments, and provide new

[11] The proposed COGATI transmission access model involves two key changes, one of which is "locational marginal pricing that aims to better reflect the underlying value of electricity in prices and so makes it more likely that new generation investment is located in the parts of the network where it can deliver the greatest benefit to consumers in the long term"; AEMC, Electricity network economic regulatory framework 2020 review, Approach Paper, 4 June 2020, 12. Even if DER pricing ends up being substantially different to the bulk supply pricing regime, there is no reason to believe that this would disincentivise DER investment, since the drivers are substantially different.

[12] AEMO, Renewable Integration Study: Part 1 report, 2020, 38.

[13] AEMO, Draft 2020 ISP, High DER scenario.

[14] Graham, P.W. and Havas, L., Projections for small-scale embedded technologies, CSIRO, 2020.

> sources of network support and energy management capabilities. The ability to take advantage of these opportunities depends on how well DER—for example, rooftop solar PV systems, household battery systems, and demand response such as home energy management systems—interact with the system. The CSIRO estimated household bills could lower by as much as $400 per year if these resources are optimised.

Technical issues

The grid was not constructed for electricity to move in two directions. While it is possible for electricity to flow upstream, it creates technical challenges at scale, especially in areas with existing network constraints and during peak periods. The boom in rooftop PV, specifically the increasingly large surplus outputs being exported to the grid in some areas in the middle of the day (especially in spring and autumn, when peak demand is relatively low), is creating technical challenges for networks.

AEMO found that in 2019, South Australia operated for a period where 64% of regional demand was met by DPV generation. By 2025, this could reach as high as 85%. AEMO estimates that other mainland NEM regions could be regularly operating close to or above 50% solar exports.[15] Likewise, data from the Clean Energy Regulator reveals that the average rooftop PV system size currently being installed is around 8 kW – far beyond most households' daytime needs and further increasing the surplus output being exported to the grid.[16]

The main technical impacts of increasing exports into the grid relate to overvoltage and breaching of thermal capacity limits. DER is not the only cause of voltage problems. Air conditioners and other large loads have the opposite effect — voltage drops.[17] However, in assessing the proposal of one network to increase its expenditure to integrate more DER into the system, the AER found:

> Evidence demonstrating that the growth in customer high-voltage complaints corresponded with the growth in solar PV where PV penetration rates are high relative to the base load on [Low Voltage] LV feeders.[18] That is, there was evidence of growing voltage non-compliance problems that is likely caused by the growth in installed PV.[19]

There are a variety of technical solutions (some of them relatively inexpensive) available for overvoltage, including transformer tap changes and the use of smart inverters. However, there is little doubt that the higher the PV penetration, the greater the impacts and the greater the need for network investment to overcome them.

Networks are able to charge users for peak loads (for example, through demand charges) to help manage under-voltage, but they are not able to charge users for peak exports to manage overvoltage. Instead they are forced to resort to other strategies like fixed export limits and reliance on inverter tripping (which renders rooftop solar power unavailable even for self-consumption) under the AS4777 overvoltage response capability.

Thermal constraints are a different matter and are a result of thermal overloading of substation transformers or fault currents caused by net reverse (upstream) flows. In some areas with high PV exports (particularly in

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[15] AEMO, Renewable Integration Study: Part 1 report, 2020, 39. DPV means Distributed PV.

[16] CER data to end March 2020 reported in https://www.energynetworks.com.au/news/energy-insider/2020-energy-insider/negative-oil-prices-lower-electricity-prices.

[17] See, e.g, UNSW CEEM, Voltage Analysis of the LV Distribution Network in the Australian National Electricity Market, May 2020. This report found that "even in the absence of solar PV, there is a significant level of high voltage across all DNSPs in all NEM states…" Overvoltage is an economic as well as technical problem for PV owners as well as networks: [17] ESB cover note on the UNSW Voltage Report, May 2020, 1. Because the causes of, and remedies for, overvoltage are contentious issues, it is important to note that MS4E would require networks, especially via the DERIS, to justify charging prosumers specifically for the cost of remedying it.

[18] A low-voltage network or secondary network is a part of electric power distribution which carries electric energy from distribution transformers to electricity meters of end customers. Low-voltage radial feeders supply multiple customers.

[19] https://www.aer.gov.au/system/files/AER%20Assessing%20Distributed%20Energy%20Resources%20%28DER%29%20Integration%20Expenditure%20consultation%20paper%20-%2028%20November%202019.pdf

South Australia), hosting capacity is being fully utilised.[20] As PV uptake and export increases, this problem will get worse.[21] The NEM and Wholesale Electricity Market (WEM) 2018 Electricity Statement of Opportunities estimates that with fast uptake of solar a quarter of all network substations would experience reverse power flows by 2025.[22]

Networks are responding with a range of grid-side and behind the meter strategies including the introduction of solar sponge tariffs (offering cheaper electricity in the middle of the day to encourage load shifting, e.g. of hot water systems), but such solutions will become less effective over time as DER uptake accelerates.

In addition to managing over-voltage and thermal issues, AEMO argues that the "ability to efficiently integrate DPV generation within… networks is severely hampered by a lack of visibility of the LV network."[23] The need for investment to improve LV network visibility is universal and urgent.

Constraints to network access and connection arrangements

As a result of these technical problems, networks are increasingly constraining DER exports using static export limits[24] to manage impacts on the physical limits of the infrastructure and minimise the need to increase DER hosting capacity. From a total system perspective, it inefficient for networks to either apply zero export limits or to build out the network to provide additional DER hosting capacity. Networks appear to be managing their constraints in different ways, including moving to dynamic export limits, and there is no clearly established set of principles for them to follow.

Inefficient and inequitable cost recovery

Some of the solutions to these technical issues are low cost, such as transformer tap changes and dynamic DER management, while others, such as augmenting network capacity, are potentially much more expensive. Implementing these strategies takes time and costs money. However, current inflexible pricing arrangements create hurdles to efficient and equitable cost recovery when the costs exceed the benefits to everyone.

Network costs account for up to two-fifths of electricity bills. At present, they are recovered primarily via consumption tariffs which, being primarily composed of flat and volumetric rather than demand- or capacity-based charges, are mostly not yet cost reflective in nature.[25]

Volumetric consumption tariffs have two main shortcomings:

- They do not send a price signal to energy users that aligns with the cost of energy consumed during times of coincident peak demand. As a result, people who use air conditioning at times of coincident peak are cross-subsidised by those who don't. Time variant volumetric pricing can reduce this cross subsidy, but is a poor substitute for a dynamic and locational cost reflective price.
- Energy users with solar PV effectively avoid volumetric charges for the portion of the energy they generate that is used onsite. The volume of energy they use from the grid is lower, meaning they pay less, even if their demand during coincident peak - and therefore the cost they place on the grid - is the same as if they didn't have solar.

Further, DER owners do not pay for the service of exporting energy to the grid, nor for any extra costs that DER may cause networks (see technical issues) — except via DER connection charges, which are a one-off

[20] https://www.sapowernetworks.com.au/public/download.jsp?id=9716, pg. 26.
[21] https://www.energynetworks.com.au/projects/electricity-network-transformation-roadmap/
[22] https://www.energynetworks.com.au/news/energy-insider/solar-saturation-sooner-than-we-thought/
[23] AEMO, Renewable Integration Study: Part 1 report, 2020, 40.
[24] See Energeia, Distributed Energy Resources Enablement Project – Discussion and Options Paper, prepared for Renew 2020, 21, Table 1.
[25] In other words, networks costs continue to be primarily recovered through charges on the amount of electricity consumed. Such charges are not particularly cost-reflective because the cost for building and operating the network is not directly related to the amount of electricity delivered by the network. That cost is much more driven by how much electricity the network needs to deliver at any particular moment.

blunt instrument which cannot respond to changing conditions over time.[26] And we cannot use consumption tariffs to recover export related costs because there is no direct relationship between consumption and export volumes.

Combined, this leads to non-DER users paying a greater share of all network costs under non-cost reflective tariffs and network revenue caps. This is disproportionately impacting millions of low-income households who spend significantly more of their income on energy bills (on average 6.4% compared to national average of 2.4%)[27] and either cannot afford, or get access to, DER technologies to reduce their energy bills.

The implementation of cost reflective tariffs (energy users pay more when they are causing a greater costs on the network) should lessen some of the problem but not fully resolve inequitable cost allocation. However, there remain barriers to implementing true cost-reflective tariffs including where some households especially vulnerable households cannot shift their consumption to less expensive times (i.e. middle of the day).

The current consumption-only network cost recovery pricing framework will create inequities where some people can reduce consumption and others can't. This will be further exacerbated where the costs to increase DER hosting capacity on the grid outweigh the benefits to all consumers of having more DER in the grid, and there is no way to recover the cost.

DER owners not incentivised to provide benefits to network

Aside from the various government subsidies most prosumers have received,[28] they are not always rewarded for the benefits they bring to networks and other consumers. Some of these benefits relate to self-consumption and storage — e.g., when PV powers air-conditioners, or when home batteries reduce evening peak demand on the grid. Others relate to the type and quality of technology installed behind the meter — e.g. when smart inverters help to balance local voltage fluctuations — or where aggregated rooftop PV and batteries reduce network constraints and/or wholesale prices.

While networks are already allowed to pay for the benefits of DER exports, they have rarely done so.[29] We are not convinced that existing tariff structures and incentive schemes are working adequately in this regard (as evidenced, for instance, by the infrequency of non-network solutions being chosen as the preferred solution in RIT-D processes). Indeed, even in locations where DER penetration is high, there are currently *disincentives* to networks investing in measures to optimise or increase DER exports. As the AEMC notes:

> …even if network revenue allowances have been built up on the basis of constraints being addressed then, in the absence of a countervailing output incentive, the operation of incentive schemes such as the efficiency benefit sharing scheme (EBSS) and capital efficiency sharing scheme (CESS) incentivises under-expenditure, with no penalty for under-delivery.[30]

Inequity between DER users

The status quo is also resulting in equity issues not only between prosumers and other consumers, but also among prosumers themselves. In network areas facing high constraints, new DER owners are being export limited to a greater extent than neighbours who invested earlier. Unless we have reforms to access and pricing arrangements, new DER will be connected on a "first come, first and best served" basis, and the last one on pays more or goes without (unless all consumers are willing to bear the cost of increased capacity).

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[26] Connection charges should be used to either reflect the cost of the equipment required to provide the connection (shallow connection costs only) or be based on the LRMC of the capacity being connected – in which case the DER owner would be funding the capacity needed for his/her export).
[27] ACOSS and BSL (2018) Energy Stressed in Australia.
[28] All solar PV owners receive a subsidy through the national Small Scale Renewable Energy Scheme (SRES) which costs are smeared across everyone's electricity bills. Some solar owners also have access to jurisdictional feed-in-tariffs (payment for the energy they export), although most of these scheme are not open to new entrants and are phasing out. Some jurisdictions provide additional subsides for the purchase of solar and batteries to drive uptake.
[29] Eg, Ausnet's now defunct Summer generation tariff.
[30] AEMC, Electricity Network Economic Regulatory Framework Review, September 2019, xi.

Limited innovation and opportunities

While rooftop PV exports are the current focus of bidirectional challenges, a range of other DER related challenges and opportunities is likely to emerge in coming years, including

- The aggregation of behind the meter batteries in Virtual Power Plants (VPPs) (e.g. when they collectively discharge into the grid to take advantage of high wholesale or Frequency Control Ancillary Services (FCAS) prices).
- Electric vehicles with vehicle to grid (V2G) capability.
- Peer-to-peer (P2P) and local energy trading (LET), which will increase utilisation of LV and some HV lines while reducing utilisation of transmission infrastructure.
- The need to rely more on DER to improve the resilience of the energy system in the face of increasing severe weather events.

There is a risk the current network access and pricing rules will act as a barrier to innovation and new trading opportunities. A regulatory regime designed from scratch for a high DER energy system would recognise the use of the network and the value of energy flows in both directions by efficiently and equitably allocating the costs and benefits of flows in each direction (consumption/imports and DER exports). As we move towards a two-sided market characterised by "active participation in the market from both the supply and demand side[s]',[31] it is critical that we reform distribution network planning/investment, access and pricing rules so that they are fit for purpose for a high DER future system.[32] This rule change is a first step in this direction.

E. STAGING

It is expected that the rule change consultation process will be completed in early 2021. The rule change would commence in mid-2022 and be applied in the 18 month lead up to the next round of regulatory determinations which come into effect in 2024 and 2025.

However, to fully achieve the stated objective as larger amounts of DER continue to enter the energy system, it is likely that fundamental as well as incremental reforms will be required. TEC and ACOSS may consider lodging a second rule change request involving the introduction of symmetrical or two way import – export pricing, to incentivise new value streams and better reward the benefits of DER while more efficiently and equitably recovering the costs of network use (refer to appendix for initial thoughts on this).

A decision on a second rule change request will be made following the completion of the consultation process for this request and the outcomes of the ESB's post 2025 market review (in particular the proposal for a two-sided market). The main determinants will be the extent to which the first rule change consultation process results in a final determination which meets our overall objective, and our assessment of the extent of stakeholder support for further reform. TEC and ACOSS would propose that a second rule change for two-way pricing, if it proceeded, would not take effect until the 2029/2030 regulatory determinations and would likely be subject to phase-in or grandfathering arrangements to protect existing owners.

F. REFORM PRINCIPLES

More Sun for Everyone gives effect to the objectives outlined above. It has been developed to reflect three core principles:

[31] ESB, Moving to a two sided market, April 2020, I.

[32] AEMO has also warned of the risks to the bulk supply system from high levels of distributed PV, but they are not the focus of this reform: see AEMO, Renewable Integration Study: Part 1 report, 2020, Ch. 3.

1. *Economic efficiency*: In line with principle 4 of the New Energy Compact ("Ensure it works"), and consistent with the National Electricity Objective (NEO, below), *More Sun for Everyone* aims to improve the utilization of existing DER and encourage investment in new DER where either there is a net market benefit or additional investment is supported by the principal beneficiaries (prosumers).
2. *Equity*: In line with principle 3 of the NEC ("Be just and fair"), *More Sun for Everyone* attempts to distribute costs, benefits and risks associated with DER integration transparently – i.e., regardless of people's ability to engage with the energy system, including whether or not they are prosumers.
3. *Decarbonisation*: In line with principle 5 of the NEC ("Deliver clean and healthy energy"), *More Sun for Everyone* should result in greater utilization of existing low carbon generation and greater uptake of new low carbon generation, assisting the shift to a zero net emissions energy system by 2030.

We regard these three principles as potentially mutually compatible.

G. SCOPE

Some of the equity issues caused by high DER penetration (especially the under-recovery of network revenue) can be dealt with through the fuller application of cost-reflective consumption tariffs. While recognising the important interaction of consumption and export tariffs, this reform does not attempt to use export pricing to solve issues related to the incomplete rollout of cost reflective consumption tariffs.

Networks would be free to introduce *More Sun for Everyone* on a locational as well as time-varying basis. Indeed, this is probably essential in view of the locational nature of network constraints. Postage stamp pricing of DER exports would be inimical to the objective of the reform.

Neither part of this reform includes guaranteed (firm) access rights for DER exports, due primarily to the legal complexities and costs involved.[33] This would also create confusion by forcing prosumers to pay for a right which most would assume that they already have. Even though that assumption on their part is not quite correct, the costs and complexities of introducing firm access may outweigh the benefits. However, as discussed above, networks should have the option of offering firmer access in return for charging prosumers for higher export capacity.

In its current form, *More Sun for Everyone* applies only to small customers — i.e. those consuming less than 100 or 160 kWh per year depending on the jurisdiction. We recognise that the final rule will need to ensure that this does not unduly favour or hinder the DER exports of larger customers connected to the distribution network.

As currently formulated, the rule change does not deal explicitly with the costs and benefits of DER self-consumption, but we welcome stakeholder input on this issue during the consultation process.

H. THE RULE CHANGE

This rule change is comprised of six incremental reforms which together will help to optimise existing and incentivise additional DER hosting capacity. #1 and #4 came out of the work of the DEIP access and pricing working group. #2, #3, #5 and #6 were recommended in the CEPA report under option 3A (Enhanced DER incentives). #4 is also a version of CEPA's option 3B. #5 is intended to be broadly consistent with SAPN's proposal for a base level of service for prosumers.

1. Encourage networks to think strategically about the role of DER exports in their future planning

[33] "Access rights are not clearly defined in a single document. The National Electricity Law (NEL), the associated NER, and state laws established the access and the process by which the associated rights are set": CEPA, 7.

This is an overarching reform which will address the planning and investment issues identified earlier. It would be achieved by introducing a requirement for networks to prepare a comprehensive 5 yearly **DER integration strategy (DERIS)** as part of a comprehensive future energy strategy.

This requirement could be included in Chapter 6, Part E, Regulatory proposal and proposed tariff structure statement. The DERIS could be combined with other existing regulatory obligations including the distribution annual planning report (DAPR) to constitute an integrated 5 yearly future network strategy for each network. It would outline current and projected DER uptake, network challenges and opportunities and proposed investments and other actions over the coming five years and beyond.

The DERIS should:

- Explain the opportunities and challenges of integrating DER into the network.
- Set out the DNSP's integrated approach of managing DER integration through the different elements of its regulatory proposal:
    - Connection policies (including export or import limits, static or dynamic).
    - Pricing (TSS including controlled load and ancillary network services).
    - Expenditure (including procurement of flexibility services from DER providers, network visibility expenditure, augmentation and voltage management expenditure).
- Set out any future plans for the regulatory period for DER integration through DMIS and DMIA projects, tariff trials, or similar (i.e. the elements where no decision is made in the distribution determination).
- Outline the degree with which connection, pricing and expenditure solutions are substitute or complement options; the trade-offs between different options the network considered; and why the network has proposed the particular approach it chose in its DER integration strategy.
- Outline how the network has consulted with stakeholders on the strategy and incorporated feedback into the strategy.

The AER would be required to assess the network's proposed DERIS and incorporate that assessment into its assessment of the individual elements of the regulatory proposal (connections, pricing, and expenditure).

2. ***Encourage networks to make the best use of existing infrastructure to maximise DER exports***

This reform addresses some of the technical and equity issues identified earlier, with an emphasis on getting the most value from existing resources. It could be achieved by introducing a new obligation to require networks to **optimise existing hosting capacity** as a network operation solution.

The current Service target performance incentive scheme (STPIS) in Chapter 6, Part C, clause 6.6.2 of the NER, should be amended to include a component related to exports.[34] This incentive would need to be based on a metric for the value of customer exports and coupled with a reliability standard for exports. CEPA discussed several design options, including "A financial reward/ penalty around a target level of headroom" and "A financial reward/ penalty to ensure that export capacity is highly utilised".

3. Encourage networks to invest in additional DER hosting capacity where this benefits all consumers

This objective complements #2 above, and ensures that new DER-related investment is recovered negatively equitably. It could be achieved by introducing **a net market benefit test** explicitly relating to the role of DER as a guiding principle of network planning and investment. According to CEPA, this would involve:

[34] CEPA, 87-88.

> Extending the principles set out in the RIT-D to all network planning decisions, to ensure that investment in hosting capacity is undertaken when it maximises net benefits. Therefore, the rules should explicitly indicate wider market benefits as a guiding principle of network planning.[35]

For instance, SA Power Networks justified its proposal to spend $32 million on capex related to a dynamic DER management strategy between 2020 and 2025 on the basis that this cost would be more than offset by the financial benefit to all consumers, not only prosumers, from the lower wholesale market costs resulting from lower peak and total demand. This methodology was accepted by the AER.[36]

The RIT-D has a threshold of $6 million, meaning that most planned DER- or LV-investments below this figure (e.g. community batteries, SAPS, statcoms, LV monitoring equipment or minor substation upgrades) are not currently subject to a market benefit test. Without this test, networks can only justify capex spending on the basis of network-specific benefits such as meeting reliability standards. With it, networks could justify capex on the basis of upstream (wholesale market) or downstream (behind the meter) benefits.

This reform could be achieved by amending 5.13.1 Distribution annual planning review to add, under Scope,

> (d) The *distribution* annual planning review must explain how the DNSP will optimise additional DER export capacity for system-wide net market benefits.
>
> Note: market benefits are as specified in 5.17 Regulatory investment test for distribution (5.17.1(c)(4)).[37]

However, the current RIT-D framework may be inadequate to capture the full range of DER benefits including avoided fuel consumption costs (which are included in the RIT-T).[38]

4. Allow prosumers subject to export constraints to put more of their surplus energy back into the grid

It is envisaged that through the implementation of # 1 to 3 above, networks will invest in additional export capacity to reduce current export constraints. Where this additional export capacity meets the net market benefit test (#3 above), the cost will be recovered from all consumers. However, some constraints may still exists for some DER owners where additional capacity has not met the net market benefit test. Access to additional capacity could be achieved by allowing prosumers subject to export constraints the **option of purchasing additional access or capacity.** In this case, the benefit is primarily private rather than system wide; therefore the cost should not be recovered from all consumers, and instead networks may give prosumers the option of buying additional access or capacity.

As discussed earlier in section D, while exact numbers of affected prosumers are unavailable, all networks are now imposing static PV and battery export limits as part of connection agreements in order to manage overvoltage and thermal capacity issues. Networks have a variety of engineering and regulatory options to deal with these issues other than static export limits, including dynamic export limits and network augmentation. However, static limits are likely to remain part of their toolbox of options for the foreseeable future, due to their administrative ease and zero cost to networks. But as DER uptake, system sizes and exports increase, these limits are likely to creep lower.

This reform is intended to enable prosumers to increase their export capacities. The added revenue would allow networks to invest to optimise existing hosting capacity (e.g. by improving LV visibility or installing new equipment to manage overvoltage) and/or to augment the network to increase hosting capacity (by enabling them to recover the associated deep connection costs). It would also ensure that other consumers do not pay

[35] CEPA, 85.

[37] However, the current RIT-D framework may be inadequate to capture the full range of DER benefits including avoided fuel consumption costs (which are included in the RIT-T).

[38] HoustonKemp has pointed out an apparent flaw in the RIT-D with regard to its treatment of non-network benefits, so in this respect the RIT-T may be a better model: see HoustonKemp, Consistency of SAPN's Kangaroo Island RIT-D with the regulatory requirements, 2017, 22.

[38] SA Power Networks, LV Management Business Case, 2019.

for the direct benefit accrued primarily to prosumers from related network expenditure. According to consultants CEPA, this would "lead to price signals being sent to prosumers that should lead to improvements in network utilisation (allocative efficiency) and more efficient future investment (dynamic efficiency), and to more fairly and equitably allocated network costs." However, CEPA notes that "the access levels and standards that these customers receive need to be clearly defined in the legislation/rules before charges are levied or rebates provided."[39]

In brief, the option to purchase additional export capacity (whether fixed — e.g. a static increase from 3 to 5 kW — or dynamic — i.e. flexible limits depending on changing network conditions) could be achieved in at least two ways:

- By changing the rules to allow networks to negotiate an export capacity agreement akin to a supplementary connection agreement. This option would allow networks to recover the costs associated with augmenting local hosting capacity upfront from prosumers.
- By amending or removing Clause 6.1.4 of the rules (see box 2) if it involves cost recovery via ongoing tariffs for exported energy (see text box below).[40] However, this option is less preferable because it would create uncertainty, risk and potential ongoing costs for prosumers.[41]

Importantly, this reform should be adopted on an opt-in basis for prosumers. We expect that many would take it up because cost-reflective network export tariffs are likely to be more than offset by the additional income from retailer feed-in tariffs.[42] It would be implemented as an option for existing connections which are already export limited or for new connections which are proposed to be export limited. Under the DERIS (#1 above), networks would be required to justify to the AER their imposition of export limits on new or upgraded connections. This would ensure that prosumers can have confidence that networks cannot impose arbitrary export limits in order to fund inefficient increases in hosting capacity.

Where this spending passes the net market benefit test and there are benefits to all consumers (i.e., socialised benefits created primarily by lowering wholesale prices),[43] it could be recovered from all beneficiaries including other consumers.[44] Some increases in export capacity, however, are likely to benefit prosumers more (through direct financial benefits and socialised benefits) than other consumers (socialised benefit only), who also pay proportionally more of the network costs. It is the latter costs which could be recovered from prosumers who choose to opt in to this reform.

While this reform does not include guaranteed (firm) access rights for DER exports (see Scope above), it would be appropriate to include a requirement for networks to actually deliver the increase in capacity that prosumers are paying for. This could take the form of a guaranteed service level (GSL) obligation. For instance, a network could offer an increase in export capacity of X kW for $Y PA with a GSL of 99% and a requirement to reimburse the prosumer for their export capacity charge if this GSL is not met.

As noted above, this reform could be implemented in two ways, depending on whether costs are recovered via (a) a second connection agreement involving a one-off payment, or (b) ongoing volumetric or demand-based charges. Specifically:

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[39] CEPA, 17.

[40] This is close to CEPA's option 3B (CEPA, 93). Note that under part one, charging for exports would be limited to cost recovery for increasing export capacity. Part two could involve the broader application of export charging.

[41] This is because ongoing volumetric charges are likely to under-recover or over-recover augmentation costs over time.

[42] Or they might want to avoid wasting zero omissions energy. Or they may want to trade or gift their surplus energy to neighbours or community groups.

[43] Note that wholesale prices may go down, but increased network charges may still result in increased bills for non-DER customers.

[44] Noting that solar owners benefit less from lower wholesale prices because they buy less of their energy from the wholesale market; and lower wholesale prices reduces the value of their FiTs. On the other hand, non-DER owners contribute more to the costs of the network that everyone benefits from directly and indirectly. [Whether lower wholesale prices will lower the FiT will depend on the way the FiT level is set].

Option (a) by amending 5.3A Establishing or modifying connection - embedded generation and/or 5A.B.2 Proposed model standing offer for basic connection services to allow for a second connection agreement to increase DER export capacity.

OR

Option (b) by amending Chapter 6, Part A, clause 6.1.4 as follows (deletion in strikethrough, new text in bold):

6.1.4 ~~Prohibition of~~ DUOS charges for the export of energy

(a) A *Distribution Network Service Provider* must not charge a *Distribution Network User distribution use of system* charges for the export of electricity generated by the user into the *distribution network* **unless**

1) the export of electricity causes costs to the DNSP which exceed the market benefit of exports, and

2) users express a willingness to pay for a higher level of access or capacity.

(b) Where both of these conditions are met, DNSPs may recover efficient costs from prosumers only to the extent that they exceed the market benefits of additional exports.

(c) Prosumers may choose whether to take up the option of paying for additional export capacity or be export limited or constrained.

(d) Prosumers who take up the option of paying for additional export capacity are entitled to receive an inconvenience payment when service performance is well outside of average levels.

(e) This does not, however, preclude charges for the provision of *connection services*.

5. Ensure all prosumers have some ability to export surplus energy to the grid

This reform is a logical outcome of #3 and #4 above, and directly addresses the current access issue identified above. It would involve a requirement for networks to offer prosumers a **base level of service for DER exports**. That is, where augmentation to add hosting capacity passes the net market benefit test, it should be mandated that networks must offer some level of export (e.g. 3Kw) – i.e., they can no longer impose zero exports. Where augmentation to add hosting capacity does not pass the net market benefit test, prosumers should be given the option of paying for it themselves (#4 above).

As such, this change could be implemented as part of one of the mechanisms suggested in #3 or #4 above. It may also require amendments to 5A.B.2 (Proposed model standing offer for basic connection services) to include Base export services.

6. Allocate hosting capacity fairly

This reform directly addresses the issue identified earlier in relation to inequities between prosumers depending on where and when they have invested in DER. It is intended to ensure that, whatever the level of DER export hosting capacity, it is allocated fairly rather than on the basis of "first come, first served" or by auctioning it off to the highest bidder. It could be implemented by an amendment to the Distribution Pricing Rules (6.18.5) – introducing a new **pricing principle to guide the allocation of existing and planned export capacity** between prosumers to provide a better balance for fairness and equity (see box below).[45]

A number of **ancillary reforms** will also be required to implement the above major reforms. For instance:

- Definitions should be updated to recognise prosumers as the export equivalent of retail customers via amendments to chapter 5A (Part A) Chapter 10 of the NER.

[45] See CEPA, 88.

- Service classifications should be amended to recognise the export of DER as a distribution service via amendments to Chapter 10 (glossary) of the NER.[46]

Box 1

Export capacity pricing principle

Imagine a network has three types of rooftop PV customers on the same feeder. Early adopters were not subject to any export limit, and their exports could be from systems between 1.5 kW and 10 kW capacity. Later installations were subject to a 5 kW export limit. New installations are prohibited from exporting anything (i.e. 0kW) because there is now no spare room on the feeder in the middle of the day.

The network decides there is a need or an appetite for increased export capacity — say, enough to give everyone either a total of 5 kW or an increase of 5 kW. A new pricing principle would be required to guide networks as to how to equitably allocate the increased capacity. Should everyone be brought up to the same level of exports, or should everyone be offered the same increase in capacity?

Either way, the added network costs would be recovered directly from the direct beneficiaries – i.e. the PV owners. This could not happen through connection agreements because this would only apply to new conditions (unless the connection agreements rules were changed). Alternately they could be recovered through a one off payment or via ongoing capacity or energy (volumetric) payments.

(While we have used the example of rooftop PV, the same principle would be applied to battery, EV and other DER exports as well.)

I. CONTRIBUTION TO THE NEO

The NEO is to "promote efficient investment in, and efficient operation and use of, electricity services for the long term interests of consumers of electricity..."[47] The AEMC interprets this as an economic objective, and as such recognises three dimensions of economic efficiency. These are outlined below with our understanding of how each dimension is broadly applied in *More Sun for Everyone*:

- *Productive efficiency*: minimising the value of resources or inputs to achieve a given output.

  The reform is designed to increase the utilisation of existing network hosting capacity, by allowing networks to remove static export limits and instead introduce opt-in export price signals in response to network constraints. It will also create an incentive for networks to increase hosting capacity where the benefits outweigh the costs.

- *Allocative efficiency:* meeting the demand for energy services by the lowest cost combination of demand and supply side solutions.

  Allocative efficiency is improved when prices reflect costs so that consumers can assess the value of the service as compared to its cost. To the extent that the proposed changes improve cost reflectivity they will enhance allocative efficiency. The rule change is intended to improve network utilisation of existing demand-side DER incentives, and to more equitably allocate the costs and benefits of DER and network investments to and from the direct beneficiaries, while reducing some cross-subsidies to prosumers from other consumers.[48]

- *Dynamic efficiency:* having the right mix of resources over time.

[46] The AEMC may also request the AER to develop a VCR equivalent for export services (VCR-E) as a proxy for understanding the value DNSPs' individual customers place on export services. However, we understand this should not require a rule change. We understand that the AER is in the process of developing a DER Guideline that will provide direction for DNSP's on how to value DER-driven network investment.
[47] The NEO is S.7 of the National Electricity Law (1995).
[48] Note that a shift to two-way pricing would maximize allocative efficiency.

The reform is explicitly designed to anticipate a future high DER energy system, especially by allowing for the gradual introduction of full two-way pricing.

More specifically, full implementation of *More Sun for Everyone* is expected to contribute to the NEO in the following ways:

- By increasing the economically efficient utilisation of existing network infrastructure (i.e. hosting capacity).
- By recovering the costs of network investments related to DER exports from direct beneficiaries.
- By incentivising lowest cost investments to increase hosting capacity.
- By increasing consumer choices (e.g. by offering prosumers choices of export limits).
- By requiring networks to reward prosumers for providing network services.
- By facilitating higher penetrations of renewable energy generation and storage, which is in the long-term interest of consumers because it assists the achievement of Australia's international climate change commitments.

J. COSTS AND BENEFITS

No modelling has yet been undertaken to assess the costs and benefits of the five elements of this rule change request. In general terms, though, under the current revenue cap regime *More Sun for Everyone* should only lead to a total increase in network revenue over the status quo where networks are able to convince the regulator that their proposed DER spending has a net market benefit, and thus that the related capex should be added to their asset base (RAB) and recovered from all consumers. It should also discourage investments to increase network hosting capacity where there are more cost effective options available to allow for higher DER exports.

Our expectations in regard to each part of the package are as follows:

1. **DER integration strategy**: This is forward-looking work which networks should be undertaking to prepare for a high DER future, so we anticipate that in the long run it should save them – and consumers – money. The regulatory burden would naturally depend on the current and projected level of DER uptake for each network.
2. **Optimise existing hosting capacity**: Any change to the STPIS should be designed to ensure that networks do not invest in new hosting capacity at the expense of making better use of existing hosting capacity, and that this obligation or incentive does not impose costs on non-prosumers.
3. **Net market benefit test:** This would ensure that new DER export-related capex can be added to the RAB and the cost recovered from all consumers only when most consumers benefit, so there should be net savings to consumers, especially via lower wholesale prices.
4. **Option of purchasing additional access or capacity:** This opt-in option would be available where additional export capacity would not pass the net market benefit test, so there would be no cost implications for other consumers or networks (see box below).
5. **Base level of service for DER exports:** Where this requirement would not pass the net market benefit test, the cost would be passed on to the affected prosumer; in either case, there would be no cost implications for other consumers or networks.
6. **Pricing principle to guide the allocation of existing and planned export capacity:** While this reform would result in some prosumers being able to export more and others less, the net effect should be neutral, with no cost implications for other consumers.

Box 2

Buying more export capacity

OakleyGreenwood was engaged to undertake a simple modelling exercise to determine the overall benefit of an increase in export capacity in two cases: where a 5kW system is currently limited to 0kW exports, and where a 7 kW system is currently limited to 5 kW. The main reason for the constraint is assumed (consistent with recent network revenue proposals) to be an overvoltage problem which could be remedied by capital expenditure of $50 million by the network. However, limited hosting capacity is increasingly likely to be a reason for constraints.

The results clearly indicate a significant net annual benefit to prosumers by increasing their export capacity even where they fund DER export-related capex. (Where network expenditure delivers a net market benefit to all consumers, the cost could be recouped from all consumers.)

Case	System size	Household load (1)	Constrained capacity	Unconstrained capacity	Extra export enabled	Charge to fund capex (2)	Gross revenue from increased export (3)	Net revenue
1	5kW	5,000kWh	0kW	5kW	4,050kWh	$14.40	$413.10	$398.70
2	7kW	5,000kWh	5kW	7kW	2,250kWh	$ 5.56	$229.50	$223.94

Notes:

- Assumed annual consumption. Load profile of the household profile is assumed to be a typical profile, and does not include any alterations to usage behaviour that could potentially be undertaken in the second case to match household consumption to PV non-constrained consumption.
- This charge is levied at $0.065 per kWh exported for an assumed duration of about 340 hours spread over approximately 50 days on which the network was constrained prior to the expenditure and due to which PV export had been constrained.
- Gross revenue assumes that all incremental export receives the current Victorian FiT of $0.102.

K. IMPACTS

The likely impacts of the *More Sun for Everyone* rule change on major stakeholders are expected to be as follows:

Prosumers

- Potential for higher income from exports with the removal of zero or static export limits (see box 4)
- Reduced chance of exports being curtailed by networks.
- Guaranteed base level of exports (not firm).
- More equitable distribution of limited hosting capacity.

Other consumers

- Long-term potential for lower bills due to reduced upstream (HV and transmission) capex and network charges (TUOS) as more energy is generated locally.
- Long-term potential for lower bills due to sharing of network costs with prosumers when they do not pass the net market benefit test.
- Long-term potential for lower bills due to lower wholesale market costs as more DER is exported, especially during peak demand periods.

Networks

- More efficient utilisation of existing hosting capacity.

- Incentives to invest in increasing hosting capacity where it is economically efficient and there is a demonstrated prosumer willingness to pay.
- Clearer regulatory signals about DER investments — in particular, the ability to recover DER related costs from direct beneficiaries.
- Reduced likelihood of DER export-related technical issues due to greater cost reflectivity changing utilisation and investment patterns.

Planet

- Less wasting of solar energy generation due to artificially low export limits.
- More renewable energy investment due to DER export benefits being recognised – e.g., in the net market benefit test.

APPENDIX: POTENTIAL FUTURE RULE CHANGE

Note: This appendix does *not* form part of the rule change request. As flagged in the body of this submission, to fully achieve the stated objective as larger amounts of DER continue to enter the energy system, it is likely more fundamental reforms will eventually be required. TEC and ACOSS may consider subsequently lodging a second rule change request involving the introduction of symmetrical or two way import–export pricing, to incentivise new value streams and better reward the benefits of DER while more efficiently and equitably recovering the costs of network use.

We have provided below some initial thinking on what our objectives would be and the potential mechanism to achieve the objectives. A decision on a second rule change request will be made following the completion of the consultation process for this request and the outcomes of the ESB's Post 2025 market review (in particular the proposal for a two-sided market). The main determinants will be the extent to which the first rule change consultation process results in a final determination which meets our overall objective, and our assessment of the extent of stakeholder support for further reform. TEC and ACOSS would propose that a second rule change for two-way pricing, if it proceeded, would not take effect until the 2029/2030 regulatory determinations and would likely be subject to phase-in or grandfathering arrangements.

Full two-way pricing

Objectives

1. To create symmetry between the regulation of consumption and export pricing, by introducing the export equivalent of the current regulatory regime around cost reflective consumption pricing.
2. To allow all network costs including sunk and short-run marginal costs to be recovered from all users in both directions according to their usage patterns.
3. To recognise the value to prosumers of the grid export service provided by networks.
4. To recognise the local use of system benefits to networks provided by DER exports.

Mechanism

Adapt the existing pricing rules for cost reflective grid consumption to incorporate export pricing.

This reform should be achieved by amending Chapter 6: Economic Regulation of Distribution Services, Part I: Distribution Pricing Rules. In particular, there should be an export equivalent of 6.18.5 (a) Network pricing objective. The expanded objective could read as follows (new text in bold):

> The *network pricing objective* is that the tariffs that a *Distribution Network Service Provider* charges **or offers** in respect of the provision of *direct control services* to **or from** a *retail customer* **or *prosumer*** should reflect the *Distribution Network Service Provider's* efficient costs of providing those services to the *retail customer* **or *prosumer*, and the value of services provided by the *prosumer* to the DNSP** OR **including any cost savings to the DNSP attributable to the *prosumer*.**

Alternately, a new objective could be created, as follows:

> **Export pricing objective**
>
> The *export pricing objective* is that tariffs for microgeneration and distributed storage (or *prosumer* exports) reflect the efficient value to the *Distribution Network Service Provider* of the *retail customer's* actions.

This rule change also involves applying to exports the current distribution pricing principles (6.18.5 € to (j)). However, because the current (consumption) pricing principles only deal with cost recovery, several additional pricing principles may be required to reward benefits and to guide the allocation of the costs resulting from increased export capacity, as follows:

- *To require networks to consider the benefits as well as costs of DER exports*. Below are two potential options – either:
    - (k) The *DNSP* must allocate to export services the network costs incurred in delivering export services to the maximum level that does not result in a lowering of overall system net benefits.

  Or to more explicitly recognise the potential network benefits of DER exports:
    - (k) *DNSPs* must consider the value of DER inputs or services including the net benefit to *prosumers* and other consumers of DER exports. This may be done on a locational or time varying basis, and should include the potential network benefits of local use of the system.
- *To allow export pricing to recognise the value of local use of the system* (LUOS). Energy wheeled between neighbours on the same part of the system (ie, the LV network) should attract lower use of system charges than energy which travels through the sub-transmission and HV networks. (This is the same logic behind distributed generation not attracting transmission use of system charges.) Potentially the current pricing principle 6.18.5(f), which requires network tariffs to be "based on the *long run marginal cost* of providing the service to which it relates to the *retail customers* assigned to that tariff", could be expanded to include the LRMC of supply (ie, providing the network service of enabling DER exports) as well as demand. If not, an additional pricing principle may be required.
- *To allow DER exports to help recover sunk network costs,* customers' exports as well as consumption should be taken into account in the development of tariff classes and LRMC-based variable charges. This should also be a consideration when network businesses determine how they seek to recover their residual costs. Specifically, 6.18.5(g)(3) should be amended to include a new subsection requiring the revenue expected to be recovered from each tariff to:

  (b) recover residual costs from tariff classes in a manner that reflects that tariff class's utilisation of the network for both consumption and export purposes.
- *To guide how networks should allocate costs between consumption and export services*. This would aim to provide transparency for customers and guidance to DNSPs. One element of this new pricing principle should be that, wherever possible, consumption and export pricing should avoid material cross subsidies in either direction, since that would contravene the overarching objective of cost reflectivity. On the other hand, it should not prevent networks from offering bundled import/export tariffs to prosumers.
- *To guide the allocation of existing and planned export capacity* between prosumers to provide a better balance for fairness and equity.

Box 3

A telco analogy

One end state of these reforms Could be that network tariffs become like telco plans. Users can choose a plan with different upload and download speeds and an overall data limit. Likewise, electricity consumers who would be able to choose a plan based on their consumption from the grid, DER self-consumption and DER exports. Users would effectively be charged for two things:

- The demand users place on the network during peak periods (the cost of augmenting the network to meet peak demand).
- Access to the service (the ongoing cost of building, operating and replacing the existing network).

By contrast, at present (to continue the analogy) users pay mostly for downloads (consumption) rather than for uploads (exports). This means that people who only download and don't upload are paying most of the costs of the network. Uploads are booming, however, so networks are throttling them because they can only recover the costs of meeting the upload demand from users who download.