

Frequency Control Framework Review Draft Report

Contribution of tiko Energy Solutions Ltd.

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tiko

Claire Richards
Australian Energy Market Commission
PO Box A2449
Sydney South NSW 1235

Olten, 24th April 2018

Re: Frequency Control Frameworks Review Draft Report EPR0059

Dear Ms. Richards,

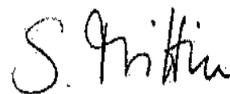
tiko Energy Solutions Ltd. welcomes the opportunity to provide the Australian Energy Market Commission (AEMC) with feedback on the Frequency Control Frameworks Review – Draft Report.

Please find our input below. Should you have any questions, please do not hesitate to contact us.

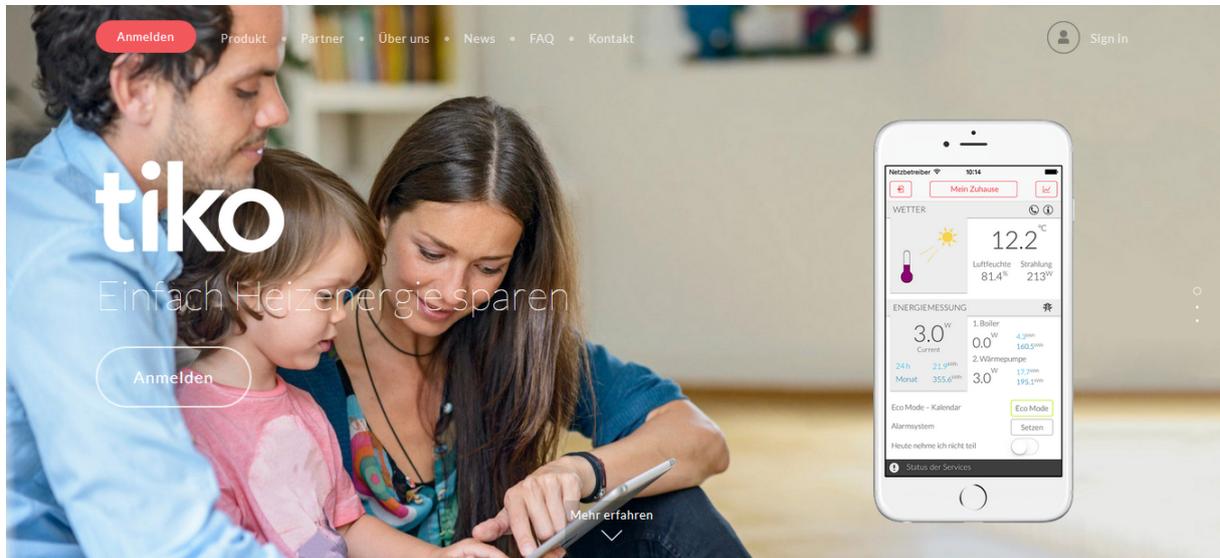
Best regards,



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A detailed response to the Australian Energy Market Commission's Draft report on Frequency Control Frameworks

tiko Energy Solutions' response to the distributed energy and load management aspects of AEMO's Consultation on Frequency Control Frameworks

“We advise to leverage all the potentials of demand response and distributed energy producing units including the once exploited by the market today.”

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Outline

tiko Energy Solutions has taken positive note of the Commission's ambitious and forward looking "Frequency Control Frameworks Control". We indeed congratulate the Australian Energy Market Commission for its ambition on fundamental challenges as regards the transformation towards a more integrated and renewables-driven power system in the frequency control market as this will have positive consequences on the Australian market for which tiko Energy Solutions (tES) which has developed innovative demand-response systems in Switzerland plans to be a technology provider.

The Frequency Control Frameworks Control focuses on the integration of renewables. Operating in several European countries in partnership with utilities, grids and device manufacturers, tiko has one of the largest real-time Smart Grids in the world based on distributed energy resources (loads and generation). tES provides Grid services from Demand Response to Frequency Regulation, as well as energy services for Intra-day and Day-ahead optimization. It enables innovative Community Business Models. With tiko the residential customers have the possibility of detailed monitoring of home production and consumption. Therefore, tiko has a positive impact on the energy future.

tES welcomes the emphasis the Frequency Control Frameworks Review on innovation and distributed energy resources. At the same time the Frequency Control Frameworks Review lacks a clear statement concerning the wish to promote demand response and to integrate the consumers' flexibility into the energy market.

This is the reason why tES recommends to refine the underlying concept of distributed energy resources in the light of demand response. In this way, the Australian Energy Market Commission would truly become an innovative market.

The present paper focuses mainly on the distributed energy resources / demand response aspects of the consultation. Demand Response is essentially a valorisation process of the flexibility – i.e. the capacity to shift consumption and production of distributed energy resources in time. This flexibility is to be seen as a natural partner in the process of the integration of distributed energy resources. As renewable energies are growing, the need for flexibility is increasing. This applies for the electricity market in general and of course also for the Frequency Control Framework. Therefore, tES advises the Australian Energy Market Commission to focus also on distributed loads.

1 Introduction

As part of the AEMC's ongoing system security work program, which comprises a number of rule changes and reviews that seek to address risks to power system security caused by the transition from conventional generation powered by coal, gas and hydro to generation powered by renewable sources such as wind and solar, the *Frequency control frameworks review* considers what changes may be required to the regulatory and market frameworks to maintain effective frequency control.

tiko Energy Solutions provides a technology platform to aggregate distributed energy resources (e.g. HVAC, water heater, heating, batteries) to provide value for grids, utilities and end-consumers. On one side the aggregated capacity can be provided as flexibility to e.g. Control Energy Markets in the form of FCR and aFRR (European definition). tiko Energy Solutions has a proven track record for the operation of a virtual power plant since 2014. On the other side tiko offers a compelling energy management system to the owner of the connected devices to increase energy efficiency and realize savings. tiko envisages to enter the Australian market as technology provider offering its hardware combined with its platform driven by an algorithm to different actors in the Australian Electricity sector.

2 General comment: we congratulate for engaging in the exercise to make distributed energy resources participate in the market

We congratulate the Commission for engaging in the exercise of the *Frequency control frameworks review*. tES supports the draft report's objective to set out the AEMC's analysis and draft recommendations in relation to the participation of distributed energy resources in system security frameworks. We agree with the AEMC that it is important to explore whether there are any unnecessary regulatory barriers that may prevent distributed energy resources providing FCAS or other system security services and provides draft recommendations on ways in which these barriers could be addressed as the uptake of distributed energy resources increases.

At the same time, we allow ourselves to state that we get the impression that the Commission endorses an energy mix based on generation resources with high inertia. The Commission's support of these resources implies the maintenance of the conventional energy mix. We hope that the positive effects of the renewable resources in terms of economics, responsiveness and granularity are embraced by the Commission and we advise the Commission to fully consider distributed loads alongside with distributed energy generation when deciding on the next steps concerning the *Frequency control frameworks*.

We regret that the Commission adopts this vision, as the consumers will not reap off many benefits.

It also seems to us, that the Commission is favouring -- perhaps involuntarily -- the incumbents and neglects innovative new players in the electricity market, such as demand response aggregators. This would contradict its own wish that distributed energy resources are integrated into the electricity market.

tiko Energy Solutions thinks that not only distributed energy resources like batteries but also distributed loads should have a level playing field with conventional energy resources for providing FCAS or other system security services.

3 Detailed comments

Demand response is not limited to dynamic pricing, as seems to insinuate the European Commission. Demand response has traditionally been used by the DSO for peak shaving and by the suppliers for load management. The new independent aggregator bundles load to intervene into the market. The business model of independent aggregators differ:

3.1 Recommendation 2 (page 7 and page 8)

The draft report states that Frequency control performance under normal operating conditions has been deteriorating in recent times, largely as a result of generators reducing or removing their provision of a voluntary 'governor response' to minor frequency deviations.

Therefore, the draft report recommends with Draft recommendation 2 that "the providers of a primary regulating response should be remunerated for the costs of providing the service, in particular where the opportunity costs of maintaining the capacity to provide the service (e.g. maintaining headroom to be able to increase output) are likely to be high."

This provision would lead in practice in a differentiation of the remuneration in accordance to the source of generation. This would then lead to a discrimination between the different sources of generation concerning the remuneration they get.

tES recommends that the remuneration will be independent of the source of generation or the kind of load and that opportunity cost aspects are not taken into consideration rather than the value of a resource for the primary regulating response market.

3.2 Chapter 7: Participation of distributed energy resources in system security frameworks (pages 9 and 102)

Chapter 7 sets out:

- an overview of the potential for distributed energy resource participation in system security frameworks
- the Commission's analysis and recommendations in relation to:
 - aggregator frameworks for distributed energy resources
 - the market ancillary services specification (MASS)

In this context, for distributed energy resources the reference is only on storage.

The draft report focuses on aggregated small generating units to offer market ancillary services.

We recommend broadening the focus and to consider not only aggregated small generating units but also aggregated small loads.

3.3 Section 7.4 Aggregator regulatory frameworks (page 108)

Page 108 of the document states: "In the issues paper for this review, the AEMC concluded that there do not appear to be any barriers in the NEM to prevent a Market Small Generation Aggregator or a Market Ancillary Service Provider (the two frameworks discussed in this section) from tendering or applying to AEMO to provide non-market ancillary services."

tES sees a substantial barrier to market in the lack of transparency of the value of such services. It is only when the remuneration and the chances for remuneration are transparent and calculable, that a Small Market Generation Aggregator or a Market Ancillary Service Provider will enter this market.

We recommend that transparency is increased so that new entrants are more comfortable to enter the market. We think that the results of the tendering should be published as for example in Switzerland (<https://www.swissgrid.ch/de/home/customers/topics/ancillary-services/tenders.html>). The indication of the volumes and the prices offers gives valuable input for the business case of new entrants.

3.4 Section 7.4.1 Existing aggregator frameworks

According to the Draft Report "Frequency Control Frameworks Review" a Small Generation Aggregator is a market participant who is able to sell the output of multiple small generating units through the NEM without the expense of individually registering each generating unit. We understand that according to the "Issues paper - Frequency Control Frameworks Review" (section 7.2.), "the existing frameworks for the connection and operation of generation and load to the power system sit in the NEM".

tES thinks that the existing aggregator framework in the "Frequency Control Frameworks Review" should spell out that Small Generation Aggregator framework (generation) include not only generation and loads.

We recommend that there should be no differentiation between small generation units and loads - EU also gives recommendation to allow loads in capacity market but not wholesale

3.5 Draft recommendation 4 (page 8 and 114)

The Draft report foresees that a rule change should be enable:

- (a) Market Ancillary Service Providers to classify small generating units as ancillary service generating units for the purposes of offering market ancillary services
- (b) Small Generation Aggregators to classify small generating units as ancillary service generating units for the purposes of offering market ancillary services.

These changes may also require changes to AEMO's MASS.

tES supports the fact that «generation units should be also eligible for market ancillary services”

tES supports the fact that the Small Generation Aggregators classify as ancillary service generating units for the purposes of offering market ancillary services. As the generating units become more and more flexible and involve less and less inertia, it is important that small aggregated loads can also qualify for offering market ancillary services.

On page 119, AEMO concludes that the requirement for high-speed recorders do not present a barrier to new entrants.

tES would like to point out that – whilst speed is not a problem from a technology point of view – the number of data points involved imply a cost. The costs linked to the volume of data might represent a barrier to entry depending on the financing of the new entrant involved.

tES recommends that a balance is made between the number of data points needed for AEMO on the one hand and the costs linked to the transmission and storage of the data for the market participants on the other hand.

3.6 Draft recommendation 5 (page 124)

Generally, non-registered participants connect under Chapter 5A of the NER. These rules apply (among others) to:

- retail customers
- micro embedded generators (e.g. retail customers with solar PV or battery storage systems)
- non-registered embedded generators (connecting a system of less than 5 MW but larger than a micro embedded generator). undertake trials with distributed energy resources.

Chapter 5A does not contain any specific requirements or guidance on the actual technical specifications of connections by retail customers to distribution networks, either with a generating system (such as a solar PV system) or without.

tES is of the opinion that the benefits of generating systems such as solar PV and batteries are substantially increased in combination with heat pumps and electrical heating. Therefore, a residential housing with a PV installation will be eager to connect all electrical devices generating and consuming to the distribution network for services to stabilise networks.

We recommend that Chapter 5A does not only specify the connection of generating systems but also the connection of residential loads such as air conditioners (HVAC), heat pumps, electrical heating and electrical water boilers.

3.7 Individual DNSP connection arrangements

As the NER is not highly prescriptive regarding the technical aspects of connections under Chapter 5A, a significant amount of discretion on the technical requirements of a distributed energy resource lies with the DNSP. Standard AS 4777 requires inverter-connected energy systems to have the ability to be remotely controlled. However, the connection arrangements in the NER, AS 4777 and DNSPs' own connection requirements do not appear to value or incentivise the provision of system security services by means of distributed energy resources.

tES believes there is no need to detail technical requirements for the connection or operation of distributed energy resources as long as it is compliant on the distribution grid level and complies with the requirements of AEMO.

tES recommends to abstain from further complication of the regulatory framework and to limit the specifications to binding specifications without having recourse to self-regulatory standards such as AS 4777

On the other hand, the regulatory framework should ensure that there is a competitive level playing field. tES notes with interest the sentence: "It may also be the case that DNSPs, through their connection arrangements, have sole access to services that can be provided by distributed energy resources."

If there are connection requirements, they should not prevent distributed energy resources from joining market ancillary services. The regulatory framework should avoid a situation where the DNSP can misuse its rights.

3.8 Draft recommendation 7 – page 137

Draft recommendation 7 foresees DNSPs and aggregators share information about the types of network conditions that may constrain the operation of distributed energy resources providing system security services, and the types of services that may affect network conditions, with a view to determining how the value of distributed energy resources can be maximised for both parties.

If the information is shared with the view of maximising value for both parties, the DNSPs and the aggregators, there needs to be a debate about the question if the system security services can be provided based on a market. If the system security services are a competitive market, dependent on the type of network condition, the distributed energy resources could be called upon. The same way it should also be clear in which way the DNSPs have priority over the aggregators of distributed energy resources.