



Smart TSO-DSO interaction schemes, market architectures and ICT Solutions for the integration of ancillary services from demand side management and distributed generation

## Newsletters published twice a year

### D7.3

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## About SmartNet

The project SmartNet (<http://smartnet-project.eu>) aims at providing architectures for optimized interaction between TSOs and DSOs in managing the exchange of information for monitoring, acquiring and operating ancillary services (frequency control, frequency restoration, congestion management and voltage regulation) both at local and national level, taking into account the European context. Local needs for ancillary services in distribution systems should be able to co-exist with system needs for balancing and congestion management. Resources located in distribution systems, like demand side management and distributed generation, are supposed to participate to the provision of ancillary services both locally and for the entire power system in the context of competitive ancillary services markets.

- Within SmartNet, answers are sought for to the following questions:
- Which ancillary services could be provided from distribution grid level to the whole power system?
- How should the coordination between TSOs and DSOs be organized to optimize the processes of procurement and activation of flexibility by system operators?
- How should the architectures of the real time markets (in particular the markets for frequency restoration and congestion management) be consequently revised?
- What information has to be exchanged between system operators and how should the communication (ICT) be organized to guarantee observability and control of distributed generation, flexible demand and storage systems?

The objective is to develop an ad hoc simulation platform able to model physical network, market and ICT in order to analyse three national cases (Italy, Denmark, Spain). Different TSO-DSO coordination schemes are compared with reference to three selected national cases (Italian, Danish, Spanish).

The simulation platform is then scaled up to a full replica lab, where the performance of real controller devices is tested.

In addition, three physical pilots are developed for the same national cases testing specific technological solutions regarding:

- monitoring of generators in distribution networks while enabling them to participate to frequency and voltage regulation,
- capability of flexible demand to provide ancillary services for the system (thermal inertia of indoor swimming pools, distributed storage of base stations for telecommunication).

## Partners



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## Executive Summary

As part of task 7.1., General communication and dissemination activities, EUI, in cooperation with the Project Coordinator (RSE) and with the contribution of all the WP leaders, will create a series of newsletter targeting both the specialized and the general public.

The present document outlines the structure of the project newsletters, the target audience as well as the Stakeholders' consultations launched together with the newsletters.

## 1 Introduction

As part of the project general communication and dissemination activities (Task 7.1.), all the project partners under the leadership of WP7 will prepare a series of newsletters to be published every 6 months during the duration of the project.

## 2 Newsletter 1 – July 2016

The project [newsletter](#) opens with a general address of the Project Coordinator introducing the project and launching the two stakeholders' consultations.

The two stakeholders' consultations cover the topics of [Basic schemes for TSO-DSO coordination and ancillary services provision](#) and [Market design](#). To give maximum flexibility and facilitate the stakeholders, the consultations are done in a way to allow them to contribute either online or by email. The first results of the stakeholders' consultations are expected by the end of September 2016.

Furthermore, the newsletter presents a series of 4 articles on the following topics:

[Towards \(Close\) Harmony: Options for Enhanced TSO-DSO Coordination](#)

[Stairway to Heaven: First Steps in Building up the Three Technological Pilots](#)

[ICT Enabling Flexible Energy Grids](#)

[Small Market Changes, Giant Leaps for DERS](#)

targeting both the specialized and general public.

The four articles are also available in the newly created blog available on the project webpage.



Finally, the newsletter provides also information on the project meeting in Copenhagen (<http://smartnet-project.eu/news/coordination-meeting-copenhagen/>) and promotes the SmartNet invited full-afternoon session at the European Utility Week in Barcelona (15 November 2016) (<http://smartnet-project.eu/news/smartnet-project-barcelona/>)

The newsletter was created and distributed using MailChimp. The target audience for the newsletter was of slightly less than 5.000 contacts (approximately 50 SmartNet Stakeholders, approximately 120 contacts of SmartNet Partners and EUI – FSR Energy List of approximately 4.700 contacts).

The newsletter is also available on the project homepage and will be shared with the project social media.

The following parameters will be monitored: open rate, click rate, 24 hour performance, top links clicked. In other words, we will monitor users' activity by see how many contacts actually received, opened, clicked on some links and which ones. The parameters will allow to monitor and compare all the newsletters among themselves.

SmartNet project | Newsletter - July 2016
[View this email in your browser](#)

Dear readers,

The Horizon.2020 project **SmartNet** aims at analyzing architectures for optimized interaction between TSOs and DSOs in managing the exchange of information for the acquisition of ancillary services from subjects located in the distribution segment.

This is the first in a series of six-monthly newsletters that will provide a flash on the main achievements of the project as well as news on its publications and events.

We have just launched our first public web consultations on two themes that are central for the SmartNet project. You can take part in the consultations until the 15 of September.

**Basic schemes for TSO-DSO coordination and ancillary services provision**

[Access the consultation](#)


**Market Design: architectures for ancillary services markets**

[Access the consultation](#)

I hope you will enjoy the readings and continue to follow our updates. For more info on SmartNet Project I invite you to our [website](#).


Best regards,  
 Gianluigi Migliavacca, SmartNet project coordinator  
[info@smartnet-project.eu](mailto:info@smartnet-project.eu) | [Gianluigi.Migliavacca@tne-web.it](mailto:Gianluigi.Migliavacca@tne-web.it)

### Articles




**Towards (close) harmony: options for enhanced TSO-DSO coordination**

The SmartNet project is analyzing different possibilities for coordination schemes between TSOs and DSOs to enable the efficient integration of DERs and flexibility in power systems. [Read the article](#)




**Small market changes, giant leaps for DERs**

The SmartNet team is developing the mathematical models that will serve as the bricks of enhanced market architectures to enable the efficient utilization of DERs. [Read the article](#)



**ICT enabling flexible energy grids**


Quick evolution in ICT opens new possibilities to build flexible energy grids taking quality, security, and performance into account. [Read the article](#)




**Stairway to Heaven: first steps in building up the three technological pillars**

Three technological pillars to demonstrate different modalities to provide to ancillary systems to the system. [Read the article](#)

### News & Events



**First internal meeting in Copenhagen**  
 5-7 July 2016, hosted by DTU  
 During this three-day meeting, the 22 project partners discussed on activities progress after 6 months from the launch and synchronized the next research activities. [Read more](#)






**SmartNet Project in Barcelona**

The SmartNet project will convene in Barcelona on 16th November for a invited full-afternoon session part of the track "Intelligent Grid". [Read more](#)

If you would like any additional information, please feel free to contact us at [info@smartnet-project.eu](mailto:info@smartnet-project.eu).

The SmartNet Project team

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## 3 Newsletter 2 – March 2017

The project newsletter opens with a general address of the Project Coordinator introducing the results of the first year of activities of the project, particularly the following deliverables:

- (D1.1) [an analysis of system services requested at 2030](#)
- (D1.3) [an in-depth analysis of TSO-DSO coordination schemes](#)
- (D3.1) [a screening of ICT requirements to implement them](#)

The newsletter also provides information on the project meeting in Helsinki (<http://smartnet-project.eu/news/highlights-from-the-smartnet-meeting-in-helsinki/>) and includes video interviews with the WP leaders and the stakeholders.

Furthermore, the newsletter promotes the SmartNet invited roundtable Innovation in Grid Services in Brussels (13 March 2017) (<http://smartnet-project.eu/news/innovation-grid-services-round-table-brussels/>) as well as the recording of the last online event organised in collaboration with the Florence School of Regulation (<http://smartnet-project.eu/news/interactive-online-debate-tso-dso-coordination/>)

Finally, the newsletter presents a series of 2 articles targeting both the specialised and general public:



- Where are we going?
- The Key is Flexibility

The articles are also available in the SmartNet blog available on the project webpage (<http://smartnet-project.eu/blog/>)

The newsletter was created and distributed using MailChimp. The target audience for the newsletter was of slightly less than 5.000 contacts (approximately 50 SmartNet Stakeholders, approximately 120 contacts of SmartNet Partners and EUI – FSR Energy List of approximately 4.700 contacts).

The newsletter is also available on the project homepage and will be shared with the project social media. The following parameters will be monitored: open rate, click rate, 24-hour performance, top links clicked. In other words, we will monitor users' activity by seeing how many contacts received, opened, clicked on some links and which ones. The parameters will allow to monitor and compare all the newsletters among themselves.

SmartNet Project | Newsletter - March 2017
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Dear Readers,

The **project SmartNet** has now reached its first year of activities. Among the most important products of this first intense year, we can quote the publication of:

- (D1.1) [an analysis of system services requested at 2030](#)
- (D1.3) [an in depth analysis of TSO-DSO coordination schemes](#)
- (D3.1) [a screening of ICT requirements to implement them](#)

Additionally, market architectures were drafted along with aggregation models and models of the resources able to provide system flexibility. Relevant deliverable will be published in the next months. All of that provided a thorough specification for the simulation environment that is now under construction.

The first months have also seen a significant participation in dissemination events, such as the [European Utility Week in Barcelona](#) where a [dedicated session was held on SmartNet](#) and the [TSO-DSO webinar organized by FSR](#).

Details on all the above can be found below in this newsletter. I hope you will enjoy reading it and encourage any kind of feedbacks.

For more info on SmartNet, please visit the [project website](#).


Best regards,  
Gianluigi Migliavacca – SmartNet Project Coordinator  
[info@smartnet-project.eu](mailto:info@smartnet-project.eu) / [Gianluigi.Migliavacca@rse-web.it](mailto:Gianluigi.Migliavacca@rse-web.it)

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### Video Highlights from Helsinki


The most recent physical meeting of the Advisory Board held during last project meeting in Helsinki on 2<sup>nd</sup> February was successful and paved the way to further collaboration. [Read more](#)

For the most relevant updates, watch the videos from the WP leaders



- [G. Migliavacca | Coordinator](#)
- [D. Six | SmartNet WP1](#)
- [S. Horsmanhelmo | SmartNet WP3](#)
- [M. Rossi | SmartNet WP4](#)
- [C. Madina | SmartNet WP5](#)


Learn more from the stakeholders' perspectives on the SmartNet Project



In the context of our project meeting in Helsinki, we asked some of the stakeholders in attendance what the significance of this project is and why it is relevant today.  
[Watch the videos](#)

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### News & Events



**Online debate: TSO-DSO coordination for electricity system balancing and congestion management**

In January 2017 the SmartNet Project Coordinator, G. Migliavacca and M. Rossi (Smartnet, RSE) took part in the online debate organised by the Florence School of Regulation. [Recording now available!](#)

**Coming soon!**




**Round table:** On 13 March 2017 the SmartNet project will participate in the experts' round table:

**Innovation in grid services. How can TSOs and DSOs use consumer flexibility for grid management?**  
[Read more](#)


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### SmartNet Blog



**The Key is Flexibility**

Smartnet partners at VTT discuss the complexities that DSOs will have to manage in the coming decades and the essential role of system flexibility.  
[Read the article](#)






**Where are we going?**

Where are DSOs going? How will they face future challenges? What is the possible role and contribution of the SmartNet project?  
[Read the article](#)

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## 4 Newsletter 3 – June 2017

The newsletter presents some of the most recent activities of the SmartNet Project:

1. Dissemination events
  - Experts Roundtable at DG Energy (Brussels), Workshop at AGORA Energiewende (Berlin), 9th Ancillary Services & Balancing Forum (Amsterdam), CIRED Conference (Glasgow) and PowerTech Conference (Manchester).
2. A SmartNet free online debate on Ancillary services from distribution: how to manage the revolution?
3. Two recent blog posts:
  - TSO-DSO coordination, market architectures and ICT for a changing energy world by Daan Six, Mario Dzamarija, Araz Ashouri, Seppo Horsmanheimo
  - The blurring distinction between electricity transmission and distribution systems by Gianluigi Migliavacca and Marco Rossi (RSE)
4. New deliverables in open access:
  - D2.3: Aggregation models: preliminary report
  - D2.4: Network and market models: preliminary report
  - D1.2: Characterisation of flexibility resources and distribution networks
  - D3.2: ICT architecture design specification
5. Smartnet on the Press: The SmartNet Project Coordinator talked with Science Impact



Dear readers,

During the past six months SmartNet has completed the **specifications of the simulation environment** as well as the **data collection** for the first of the three countries to be simulated, Italy, Denmark and Spain.

The **build-up of the simulation platform** has started while the **technological pilots** are set to start exercise by September.

In 2017 SmartNet has joined many important **dissemination events**: [Experts Roundtable at DG Energy](#) (Brussels), [Workshop at AGORA Energiewende](#) (Berlin), [9th Ancillary Services & Balancing Forum](#) (Amsterdam).

In June we participated in the [CIRED Conference](#) (Glasgow) and our project has been the object of a dedicated session at the [PowerTech Conference](#) (Manchester).

On 26-28 June the technical Work Packages of the SmartNet Project will meet in Bilbao to present and discuss their results.

In July 2017 we will be pleased to invite the European Stakeholders to join the next web consultations which will be published on the SmartNet website.

We look forward to your feedback!

Gianluigi Migliavacca, SmartNet project coordinator

## Online debate

### Ancillary services from distribution: how to manage the revolution?



23 June 2017 2 - 3pm CEST

Our team is pleased to participate in the online debate organised by the Florence School of Regulation.

[Read more about the event](#)

[Register for the debate](#)

## Just published!

### Ancillary Services from distribution: utopia or business case?



**TSO-DSO coordination, market architectures and ICT for a changing energy world**

by Daan Six, Mario Dzamarjia, Araz Ashouri, Seppo Horsmanheimo

[Read the article](#)



### The blurring distinction between electricity transmission and distribution systems

by Gianluigi Migliavacca and Marco Rossi (RSE)

[Read the article here](#)

## New Deliverables online!

[D2.3: Aggregation models: preliminary report](#)

[D2.4: Network and market models: preliminary report](#)

[D1.2: Characterisation of flexibility resources and distribution networks](#)

[D3.2: ICT architecture design specification](#)



### Smartnet on the Press

The SmartNet Project Coordinator talked with Science Impact about the challenges involved in integrating renewable energy sources into Europe's existing electricity transmission network and how our project will support future innovations in this area.

- [Download the article](#)
- [Read the full publication online](#)

If you would like any additional information, please feel free to contact us at [info@smartnet-project.eu](mailto:info@smartnet-project.eu).

The SmartNet Project team

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## 5 Newsletter 4 – January 2018

The newsletter presents some of the most recent activities of the SmartNet Project:

1. Launch of the [SmartNet video](#)
2. Dissemination activities
  - SmartNet at Future Power Market workshop, SmartNet at Global Forum Electricity Ancillary Services & Balancing, SmartNet at the Pentilateral Forum, SmartNet at the European Utility Week SmartNet at the EDSO workshop: Rethinking distribution grids, SmartNet at ENTSO-E Internal Ancillary Services Conference
3. New blog posts:
  - Ancillary Services from Distribution: Utopia or Business Case? by G.Migliavacca, M.Rossi, D.Six, M. Džamarija, A. Ashouri, S. Horsmanheimo, C. Madina, L. Ortolano, H. Madsen, M. Pardo and SmartNet interviews: a talk with the project leader, Gianluigi Migliavacca
4. New Publication in open-access:
  - [Coordination between transmission and distribution system operators in the electricity sector: a conceptual framework](#) H. Gerard, E. Puente, D. Six
  - [Aggregation model for curtailable generation and sheddable loads](#) H. Marthinsen, A. Z.Morch, M. Plećaš, I. Kockar, M. Džamarija
  - [SmartNet: A H2020 project analysing TSO-DSO interaction to enable ancillary services provision from distribution networks](#) G. Migliavacca, M. Rossi, D. Six, M. Džamaria, S. Horsmanheimo, C. Madina, I. Kockar, J. Morales
  - [SmartNet: a new Horizon2020 project studying TSO-DSO interaction to acquire ancillary services from distribution networks](#) G. Migliavacca
  - [Coordination Schemes for the Integration of Transmission and Distribution System Operations](#) A. Papavasiliou, I. Mezghani
  - [Convex power flow models for scalable electricity market modelling](#) F. Geth, R.D'Hulst, D. Van Hertem
  - [Aggregation model for curtailable generation and sheddable loads](#) H. Marthinsen, M. Plecas, M. Džamaria
5. Presenting the next SmartNet Project Meeting in Glasgow on the 31 January 2018

SmartNet project | Newsletter - January 2018

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Welcome to a smarter world...



Dear readers,

The Horizon2020 project **SmartNet** has entered its third year of activity and we would like to share this amazing journey with you:

[Watch the new SmartNet video](#)

During the last six months, the simulation platform was completed and the first of the three scenarios, the Italian one, was outlined. Hence, we will be able to show to the stakeholders attending the Advisory Board of our project the results of the first runs and those of the preliminary cost-benefit analysis to compare the TSO-DSO coordination schemes. In the same meeting, the progress made in the three technical pilots (now all in exercise) will be illustrated.

The Advisory Board meeting is taking place in Glasgow in the morning of 1<sup>st</sup> February 2018. Are you interested? Please let us know!

In this newsletter you will find the latest updates from the project, including our recent publications and major contributions to the leading events in the energy sector.

We hope you will enjoy the reading and we look forward to seeing many of you in Glasgow for our advisory board meeting.

Best regards,  
Gianluigi Miglavacca, SmartNet Project Coordinator  
[info@smartnet-project.eu](mailto:info@smartnet-project.eu) | [Gianluigi.Miglavacca@rse-web.it](mailto:Gianluigi.Miglavacca@rse-web.it)

## News & Events



### SmartNet at Future Power Market workshop

On 11 January 2018, the SmartNet Project has been invited to contribute to the workshop on TSO-DSO-PX Cooperation, organised by DIW in Milan. [Read more](#)



### SmartNet at Global Forum Electricity Ancillary Services & Balancing

On 23 November 2017, SmartNet landed in Berlin to present the pilot projects. [Read more](#)

Interested in our events? Find more on our website!

[SmartNet at the Pentilateral Forum](#) | [SmartNet at the European Utility Week](#)  
[SmartNet at the EDSO workshop: Rethinking distribution grids](#)  
[SmartNet at ENTSO-E Internal Ancillary Services Conference](#)

[Find all the presentations online](#)

## Blog



### Ancillary Services from Distribution: Utopia or Business Case?

by G. Miglavacca, M. Rossi, D. Six, M. Dzamarija, A. Ashouri, S. Horsmanheimo, C. Madina, L. Ortolano, H. Madsen, M. Pardo  
[Read the article on Medium](#)  
[Watch the recording of the online debate](#)



### SmartNet interviews

a talk with the project leader, Gianluigi Miglavacca

[Read the interview](#)  
[Watch more](#)

## Publications

Find our papers in open access:

[Coordination between transmission and distribution system operators in the electricity sector: a conceptual framework](#) H. Gerard, E. Puente, D. Six  
[Approximation model for curtailable generation and sheddable loads](#) H. Mathiesen, A. Z. Mørch, M. Piecas, I. Kocak, M. Dzamarija  
[SmartNet: A Horizon2020 project studying TSO-DSO interaction to enable ancillary services provision from distribution networks](#) G. Miglavacca, M. Rossi, D. Six, M. Dzamarija, S. Horsmanheimo, C. Madina, L. Kocak, J. Morsen  
[SmartNet: a new Horizon2020 project studying TSO-DSO interaction to acquire ancillary services from distribution networks](#) G. Miglavacca  
[Coordination Schemes for the Integration of Transmission and Distribution System Operations](#) A. Papavasiliou, I. Meeghari  
[Convex power flow models for scalable electricity market modelling](#) F. Geth, R. D'Hulst, D. Van Hertem  
[Approximation model for curtailable generation and sheddable loads](#) H. Mathiesen, M. Piecas, M. Dzamarija



### SmartNet Project Meeting in Glasgow

On 31 January 2018, the SmartNet project will convene in Glasgow to meet and discuss with the project partners and stakeholders. More updates coming soon!

If you would like any additional information, please feel free to contact us at [info@smartnet-project.eu](mailto:info@smartnet-project.eu).

The SmartNet Project team

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## 6 Newsletter 5 – September 2018

The newsletter presents some of the most recent activities of the SmartNet Project:

1. Communication of the [SmartNet Workshop Series in Florence](#)
2. Dissemination activities:
  - SmartNet at IRED 2018
  - SmartNet at CIGRE - publications online!
3. Video interviews from the SmartNet Workshop in Brussels
  - [TSO-DSO coordination schemes](#) H. Gerard (VITO/EnergyVille)
  - [Flexibility from thermal inertia](#) H. Madsen (DTU)
  - [Flexibility from radio base stations](#) M. Pardo (Endesa)
  - [What can we learn from SmartNet?](#) G. Migliavacca (RSE)
4. Open Access Publications
  - [Design and Simulation of Novel Demand Response Management Systems under Enhanced TSO-DSO Interaction](#) M. Marroquin, C. Madina, M. Pardo
  - [A Generalized Nash Equilibrium Analysis of Electric Power Transmission-Distribution Coordination](#) I. Mezghani, A. Papavasiliou, H. Le Cadre
  - [A Network Flow Model for Price-Responsive Control of Deferrable Load Profiles](#) J. Camargo, F. Spiessens, C. Hermans





## 7 Newsletter 6 – April 2019

The newsletter presents some of the most recent activities of the SmartNet Project:

1. Communication of the [Final Project Meeting on 16 May 2019](#)
2. Communication of an Online Debate with SmartNet: [Looking for flexibility in the electricity sector: insights from two EU-funded projects](#)
3. New Deliverables:
  - Deliverable 6.2: [Evaluation on project results related to a number of models and roadmaps](#)
  - Deliverable 4.4: [Lab-environment set-up and simulations](#)
  - Deliverable 2.2: [Network and market models](#)
4. Open Access Publications
  - [Applying the Smart Grid Architecture Model for Designing and Validating System-of-Systems in the Power and Energy Domain: A European Perspective](#)
  - [A game-theoretic analysis of transmission-distribution system operator coordination](#)
  - [Energy in Europe: A SmartNet to boost the green revolution](#)



Dear readers,

we are glad to invite you to our upcoming events and to inform you that new deliverables and publications are now available online.

#### Final Project Meeting on 16 May 2019 Hotel Concorde I Arona (Italy)

We look forward to welcoming the most important European stakeholders and discussing our final results with all the participants!

[More info here](#) | [See the agenda](#)

[Register](#)

Participation in the meeting is free of charge. However, registration is necessary.

#### Online debate I 12 April 11-12noon CEST

##### Looking for flexibility in the electricity sector: insights from two EU-funded projects

SmartNet will participate in the FSR online debate in collaboration with the Horizon2020 Osmose. [Read more](#)

##### Moderated by:

- Nicolo Rossetto (FSR)

##### Speakers:

- Guillaume Lehec (ENGIE)
- Gianluigi Migliavacca (SmartNet project, RSE)
- Christoph Weber (OSMOSE project)

[Register here](#)

#### New deliverables online!



- Deliverable 6.2: [Evaluation on project results related to a number of models and roadmaps](#)
- Deliverable 4.4: [Lab-environment set-up and simulations](#)
- Deliverable 2.2: [Network and market models](#)

#### SmartNet News & Views

On 2 April in Stockholm, the SmartNet Project Coordinator, Gianluigi Migliavacca participated on the International Smart Grids Action Network.

[See all the news](#)



#### Latest publications

[Applying the Smart Grid Architecture Model for Designing and Validating System-of-Systems in the Power and Energy Domain: A European Perspective](#)  
M. Usler, S. Rohjans, C. Neureiter, F. Pröbstl Andrén, J. Velasquez, C. Steinbrink, V. Etthymiou, G. Migliavacca, S. Horsmanheimo, H. Brunner, T. Strasser  
Energies, January 2019, [10.3390/en12020258](#)

[A game-theoretic analysis of transmission-distribution system operator coordination](#)  
H. Le Cadre, I. Mezghani, A. Papavasiliou  
European Journal of Operational Research, September 2018, [10.1016/j.ejor.2018.09.043](#)

[Energy in Europe: A SmartNet to boost the green revolution](#)  
G. Migliavacca  
Open Access Government, October 2018

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