Coordination of Interdependent Electricity Grid and Natural Gas Network—a Review

Current Sustainable/Renewable Energy Reports

March 2018, Volume 5, Issue 1, pp 23–36 | Cite as

- Chuan He (1)
- Xiaping Zhang (2)
- Tianqi Liu (1)
- Lei Wu (3)
- Mohammad Shahidehpour (4) Email author (ms@iit.edu)

1. Sichuan University, , Chengdu, China
2. Peak Reliability, , Loveland, USA
3. Clarkson University, , Potsdam, USA
4. Illinois Institute of Technology, , Chicago, USA

Energy Markets (R Sioshansi and S Mousavian, Section Editors)
First Online: 13 February 2018

Part of the following topical collections:

1. Topical Collection on Energy Markets

Abstract

Purpose of Review

The fast growth of gas-fired generating units and the new emerging power-to-gas (PtG) technology have intensified the interdependency of the electricity grid and the natural gas network. Indeed, the security and economy of one system could directly and significantly affect that of the other. In observing these new trends and changes, a coordinated optimization between the two energy systems has attracted increasing attentions in recent years, which is believed to derive much more satisfactory solutions than optimized separately. Thus, this paper provides a comprehensive review of existing works on the coordination of interdependent electricity grid and natural gas network.

Recent Findings

The paper first highlights the modeling of key coupling components and discusses various coordination strategies of the two energy systems. The review then focuses on three major aspects of the coordination: coordinated short-term scheduling, coordinated long-term expansion planning, and energy market and energy hub.

Summary

Research and practical implementation on coordination of the interdependent electricity and natural gas system (IENS) are still in the infant stage. Challenges and potential future research directions that could further benefit the secure, reliable, and economic operation and planning of future IENS are summarized.

Keywords

Coordination Electricity grid Energy hub Energy market Natural gas network Operation Planning

This article is part of the Topical Collection on *Energy Markets*

Notes

Compliance with Ethical Standards

Conflict of Interest

The authors declare that they have no conflicts of interest.

Human and Animal Rights and Informed Consent

This article does not contain any studies with human or animal subjects performed by any of the authors.

References

Papers of particular interest, published recently, have been highlighted as: • Of importance

1. IEA, World Energy Outlook. 2011. [Online]. Available: http://www.worldenergyoutlook.org/weo2011/ (http://www.worldenergyoutlook.org/weo2011/).
2. EIA, Monthly Energy Review. 2016. [Online]. Available: http://www.eia.gov/totalenergy/data/monthly/#naturalgas/ (http://www.eia.gov/totalenergy/data/monthly/%23naturalgas/).
3. NERC. Accommodating an Increased Dependence on Natural Gas for Electric Power. 2013. [Online]. Available: http://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_PhaseII_FINAL.pdf (http://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_PhaseII_FINAL.pdf).
4. Gahleitner G. Hydrogen from renewable electricity: an international review of power-to-gas pilot plants for stationary applications. Int J Hydrog Energy. 2013;38(5):2039–61. https://doi.org/10.1016/j.ijhydene.2012.12.010 (https://doi.org/10.1016/j.ijhydene.2012.12.010).
CrossRef (https://doi.org/10.1016/j.ijhydene.2012.12.010)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Hydrogen%20from%20renewable%20electricity%3A%20an%20international%20review%20of%20power-to-gas%20pilot%20plants%20for%20stationary%20applications&author=G.%20Gahleitner&journal=Int%20J%20Hydrog%20Energy&volume=38&issue=5&pages=2039-2061&publication_year=2013&doi=10.1016%2Fj.ijhydene.2012.12.010)
5. Guandalini G, Campanari S, Romano M. Power-to-gas plants and gas turbines for improved wind energy dispatchability: energy and economic assessment. Appl Energy. 2015;147:117–30. https://doi.org/10.1016/j.apenergy.2015.02.055 (https://doi.org/10.1016/j.apenergy.2015.02.055).
CrossRef (https://doi.org/10.1016/j.apenergy.2015.02.055)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Power-to-gas%20plants%20and%20gas%20turbines%20for%20improved%20wind%20energy%20dispatchability%3A%20energy%20and%20economic%20assessment&author=G.%20Guandalini&author=S.%20Campanari&author=M.%20Romano&journal=Appl%20Energy&volume=147&pages=117-130&publication_year=2015&doi=10.1016%2Fj.apenergy.2015.02.055)
6. Shahidehpour M, Yong F, Wiedman T. Impact of natural gas infrastructure on electric power systems. Proc IEEE. 2005;93(5):1042–56. https://doi.org/10.1109/JPROC.2005.847253 (https://doi.org/10.1109/JPROC.2005.847253).
CrossRef (https://doi.org/10.1109/JPROC.2005.847253)
Google Scholar (http://scholar.google.com

/scholar_lookup?title=Impact%20of%20natural%20gas%20infrastructure%20on%20electric%20power%20systems&author=M.%20Shahidehpour&author=F.%20Yong&author=T.%20Wiedman&journal=Proc%20IEEE&volume=93&issue=5&pages=1042-1056&publication_year=2005&doi=10.1109%2FJPROC.2005.847253)

7. Tor O, Shahidehpour M. Crossroads of power: coordinating electricity and natural gas infrastructures in Turkey. IEEE Power Energ Mag. 2014;12:49–62. https://doi.org/10.1109/MPE.2014.2347653 (https://doi.org/10.1109/MPE.2014.2347653).
CrossRef (https://doi.org/10.1109/MPE.2014.2347653)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Crossroads%20of%20power%3A%20coordinating%20electricity%20and%20natural%20gas%20infrastructures%20in%20Turkey&author=O.%20Tor&author=M.%20Shahidehpour&journal=IEEE%20Power%20Energ%20Mag&volume=12&pages=49-62&publication_year=2014&doi=10.1109%2FMPE.2014.2347653)

8. Dai C, Wu L, Wu H. A multi-band uncertainty set based robust SCUC with spatial and temporal budget constraints. IEEE Trans Power Syst. 2016;31(6):4988–5000. https://doi.org/10.1109/TPWRS.2016.2525009 (https://doi.org/10.1109/TPWRS.2016.2525009).
CrossRef (https://doi.org/10.1109/TPWRS.2016.2525009)
Google Scholar (http://scholar.google.com/scholar_lookup?title=A%20multi-band%20uncertainty%20set%20based%20robust%20SCUC%20with%20spatial%20and%20temporal%20budget%20constraints&author=C.%20Dai&author=L.%20Wu&author=H.%20Wu&journal=IEEE%20Trans%20Power%20Syst&volume=31&issue=6&pages=4988-5000&publication_year=2016&doi=10.1109%2FTPWRS.2016.2525009)

9. Liu Y, Li J, Wu L, Ortmeyer T. Chordal relaxation based ACOPF for unbalanced distribution systems with DERs and voltage regulation devices. IEEE Trans Power Syst. 2017. (to appear). https://doi.org/10.1109/TPWRS.2017.2707564 (https://doi.org/10.1109/TPWRS.2017.2707564).

10. Liu C, Shahidehpour M, Wang J. Coordinated scheduling of electricity and natural gas infrastructures with a transient model for natural gas flow. Chaos. 2011;21:1–12. https://doi.org/10.1063/1.3600761 (https://doi.org/10.1063/1.3600761).
CrossRef (https://doi.org/10.1063/1.3600761)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Coordinated%20scheduling%20of%20electricity%20and%20natural%20gas%20infrastructures%20with%20a%20transient%20model%20for%20natural%20gas%20flow&author=C.%20Liu&author=M.%20Shahidehpour&author=J.%20Wang&journal=Chaos&volume=21&pages=1-12&publication_year=2011&doi=10.1063%2F1.3600761)

11. Zhou Y, Gu C, Wu H, Song Y. An equivalent model of gas networks for dynamic analysis of gas-electricity systems. IEEE Trans Power Syst. 2017;32(6):4255:64.
Google Scholar (https://scholar.google.com/scholar?q=Zhou%20Y%2C%20Gu%20C%2C%20Wu%20H

%2C%20Song%20Y.%20An%20equivalent%20model%20of%20gas%20networks%20for%20dynamic%20analysis%20of%20gas-electricity%20systems.%20IEEE%20Trans%20Power%20Syst.%202017%3B32%286%29%3A4255%3A64.)

12. Menon E. Gas pipeline hydraulics. Boca Raton: Taylor & Francis; 2005. https://doi.org/10.1201/9781420038224 (https://doi.org/10.1201/9781420038224).
CrossRef (https://doi.org/10.1201/9781420038224)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Gas%20pipeline%20hydraulics&author=E.%20Menon&publication_year=2005)

13. Ríos-Mercado RZ, Borraz-Sánchez C. Optimization problems in natural gas transportation systems: a state-of-the-art review. Appl Energy. 2015;147:536–55. https://doi.org/10.1016/j.apenergy.2015.03.017 (https://doi.org/10.1016/j.apenergy.2015.03.017).
CrossRef (https://doi.org/10.1016/j.apenergy.2015.03.017)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Optimization%20problems%20in%20natural%20gas%20transportation%20systems%3A%20a%20state-of-the-art%20review&author=RZ.%20R%C3%ADos-Mercado&author=C.%20Borraz-S%C3%A1nchez&journal=Appl%20Energy&volume=147&pages=536-555&publication_year=2015&doi=10.1016%2Fj.apenergy.2015.03.017)

14. Thompson M. Natural gas storage valuation, optimization, market and credit risk management. J Commod Mark. 2016;2(1):26–44. https://doi.org/10.1016/j.jcomm.2016.07.004 (https://doi.org/10.1016/j.jcomm.2016.07.004).
CrossRef (https://doi.org/10.1016/j.jcomm.2016.07.004)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Natural%20gas%20storage%20valuation%2C%20optimization%2C%20market%20and%20credit%20risk%20management&author=M.%20Thompson&journal=J%20Commod%20Mark&volume=2&issue=1&pages=26-44&publication_year=2016&doi=10.1016%2Fj.jcomm.2016.07.004)

15. Liu C, Shahidehpour M, Li Z, Fotuhi-Firuzabad M. Component and mode models for the short-term scheduling of combined-cycle units. IEEE Trans Power Syst. 2009;24:976–90. https://doi.org/10.1109/TPWRS.2009.2016501 (https://doi.org/10.1109/TPWRS.2009.2016501).
CrossRef (https://doi.org/10.1109/TPWRS.2009.2016362)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Component%20and%20mode%20models%20for%20the%20short-term%20scheduling%20of%20combined-cycle%20units&author=C.%20Liu&author=M.%20Shahidehpour&author=Z.%20Li&author=M.%20Fotuhi-Firuzabad&journal=IEEE%20Trans%20Power%20Syst&volume=24&pages=976-990&publication_year=2009&doi=10.1109%2FTPWRS.2009.2016501)

16. Morales-Espana G, Correa-Posada C, Ramos A. Tight and compact MIP

formulation of configuration-based combined-cycle units. IEEE Trans Power Syst. 2016;31:1350–9. https://doi.org/10.1109/TPWRS.2015.2425833 (https://doi.org/10.1109/TPWRS.2015.2425833).
CrossRef (https://doi.org/10.1109/TPWRS.2015.2425833)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Tight%20and%20compact%20MIP%20formulation%20of%20configuration-based%20combined-cycle%20units&author=G.%20Morales-Espana&author=C.%20Correa-Posada&author=A.%20Ramos&journal=IEEE%20Trans%20Power%20Syst&volume=31&pages=1350-1359&publication_year=2016&doi=10.1109%2FTPWRS.2015.2425833)

17. Li T, Eremia M, Shahidehpour M. Interdependency of natural gas network and power system security. IEEE Trans Power Syst. 2008;23(4):1817–24. https://doi.org/10.1109/TPWRS.2008.2004739 (https://doi.org/10.1109/TPWRS.2008.2004739).
CrossRef (https://doi.org/10.1109/TPWRS.2008.2004739)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Interdependency%20of%20natural%20gas%20network%20and%20power%20system%20security&author=T.%20Li&author=M.%20Eremia&author=M.%20Shahidehpour&journal=IEEE%20Trans%20Power%20Syst&volume=23&issue=4&pages=1817-1824&publication_year=2008&doi=10.1109%2FTPWRS.2008.2004739)

18. Lu B, Shahidehpour M. Unit commitment with flexible generating units. IEEE Trans Power Syst. 2015;20:1022–34. https://doi.org/10.1109/TPWRS.2004.840411 (https://doi.org/10.1109/TPWRS.2004.840411).
CrossRef (https://doi.org/10.1109/TPWRS.2004.840411)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Unit%20commitment%20with%20flexible%20generating%20units&author=B.%20Lu&author=M.%20Shahidehpour&journal=IEEE%20Trans%20Power%20Syst&volume=20&pages=1022-1034&publication_year=2015&doi=10.1109%2FTPWRS.2004.840411)

19. Zeng Q, Fang J, Li J, Chen Z. Steady-state analysis of the integrated natural gas and electric power system with bi-directional energy conversion. Appl Energy. 2016;184:1483–92. https://doi.org/10.1016/j.apenergy.2016.05.060 (https://doi.org/10.1016/j.apenergy.2016.05.060).
CrossRef (https://doi.org/10.1016/j.apenergy.2016.05.060)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Steady-state%20analysis%20of%20the%20integrated%20natural%20gas%20and%20electric%20power%20system%20with%20bi-directional%20energy%20conversion&author=Q.%20Zeng&author=J.%20Fang&author=J.%20Li&author=Z.%20Chen&journal=Appl%20Energy&volume=184&pages=1483-1492&publication_year=2016&doi=10.1016%2Fj.apenergy.2016.05.060)

20. Zheng J, Wu Q, Jing Z. Coordinated scheduling strategy to optimize conflicting benefits for daily operation of integrated electricity and gas networks. Appl Energy. 2017;192:370–81. https://doi.org/10.1016/j.apenergy.2016.08.146 (https://doi.org/10.1016/j.apenergy.2016.08.146).
CrossRef (https://doi.org/10.1016/j.apenergy.2016.08.146)

Google Scholar (http://scholar.google.com/scholar_lookup?title=Coordinated%20scheduling%20strategy%20to%20optimize%20conflicting%20benefits%20for%20daily%20operation%20of%20integrated%20electricity%20and%20gas%20networks&author=J.%20Zheng&author=Q.%20Wu&author=Z.%20Jing&journal=Appl%20Energy&volume=192&pages=370-381&publication_year=2017&doi=10.1016%2Fj.apenergy.2016.08.146)

21. Qadrdan M, Ameli H, Strbac G, Jenkins N. Efficacy of options to address balancing challenges: integrated gas and electricity perspectives. Appl Energy. 2017;190:181–90. https://doi.org/10.1016/j.apenergy.2016.11.119 (https://doi.org/10.1016/j.apenergy.2016.11.119).
CrossRef (https://doi.org/10.1016/j.apenergy.2016.11.119)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Efficacy%20of%20options%20to%20address%20balancing%20challenges%3A%20integrated%20gas%20and%20electricity%20perspectives&author=M.%20Qadrdan&author=H.%20Ameli&author=G.%20Strbac&author=N.%20Jenkins&journal=Appl%20Energy&volume=190&pages=181-190&publication_year=2017&doi=10.1016%2Fj.apenergy.2016.11.119)

22. Wu S, Ríos-Mercado R, Boyd E, Scott L. Model relaxations for the fuel cost minimization of steady-state gas pipeline networks. Math Comput Model. 2000;31(2–3):197–220. https://doi.org/10.1016/S0895-7177(99)00232-0 (https://doi.org/10.1016/S0895-7177(99)00232-0).
CrossRef (https://doi.org/10.1016/S0895-7177(99)00232-0)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Model%20relaxations%20for%20the%20fuel%20cost%20minimization%20of%20steady-state%20gas%20pipeline%20networks&author=S.%20Wu&author=R.%20R%C3%ADos-Mercado&author=E.%20Boyd&author=L.%20Scott&journal=Math%20Comput%20Model&volume=31&issue=2%E2%80%933&pages=197-220&publication_year=2000&doi=10.1016%2FS0895-7177%2899%2900232-0)

23. He C, Wu L, Liu T, Bie Z. Robust co-optimization planning of interdependent electricity and natural gas systems with a joint N-1 and probabilistic reliability criterion. IEEE Trans Power Syst. 2017:1. https://doi.org/10.1109/TPWRS.2017.2727859 (https://doi.org/10.1109/TPWRS.2017.2727859). (to appear)

24. He C, Liu T, Wu L, Shahidehpour M. Robust coordination of interdependent electricity and natural gas systems in day-ahead scheduling for facilitating volatile renewable generations via power-to-gas technology. J Mod Power Syst Clean Energy. 2017;5(3):375–88. https://doi.org/10.1007/s40565-017-0278-z (https://doi.org/10.1007/s40565-017-0278-z).
CrossRef (https://doi.org/10.1007/s40565-017-0278-z)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Robust%20coordination%20of%20interdependent%20electricity%20and%20natural%20gas%20systems%20in%20day-ahead%20scheduling%20for%20facilitating%20volatile%20renewable%20generations%20via%20power-to-gas%20technology&author=C.%20He&author=T.%20Liu&author=L.%20Wu&author=M.%20Shahidehpour&

journal=J%20Mod%20Power%20Syst%20Clean%20Energy&volume=5&issue=3&pages=375-388&publication_year=2017&doi=10.1007%2Fs40565-017-0278-z)

25. Götz M, Lefebvre J, Mörs F, McDaniel Koch A, Graf F, Bajohr S, et al. Renewable power-to-gas: a technological and economic review. Renew Energy. 2016;85:1371–90. https://doi.org/10.1016/j.renene.2015.07.066 (https://doi.org/10.1016/j.renene.2015.07.066).
CrossRef (https://doi.org/10.1016/j.renene.2015.07.066)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Renewable%20power-to-gas%3A%20a%20technological%20and%20economic%20review&author=M.%20G%C3%B6tz&author=J.%20Lefebvre&author=F.%20M%C3%B6rs&author=A.%20McDaniel%20Koch&author=F.%20Graf&author=S.%20Bajohr&author=R.%20Reimert&author=T.%20Kolb&journal=Renew%20Energy&volume=85&pages=1371-1390&publication_year=2016&doi=10.1016%2Fj.renene.2015.07.066)

26. Jentsch M, Trost T, Sterner M. Optimal use of power-to-gas energy storage systems in an 85% renewable energy scenario. Energy Procedia. 2014;46:254–61. https://doi.org/10.1016/j.egypro.2014.01.180 (https://doi.org/10.1016/j.egypro.2014.01.180).
CrossRef (https://doi.org/10.1016/j.egypro.2014.01.180)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Optimal%20use%20of%20power-to-gas%20energy%20storage%20systems%20in%20an%2085%25%20renewable%20energy%20scenario&author=M.%20Jentsch&author=T.%20Trost&author=M.%20Sterner&journal=Energy%20Procedia&volume=46&pages=254-261&publication_year=2014&doi=10.1016%2Fj.egypro.2014.01.180)

27. Qadrdan M, Abeysekera M, Chaudry M, Wu J, Jenkins N. Role of power-to-gas in an integrated gas and electricity system in Great Britain. Int J Hydrog Energy. 2015;40(17):5763–75. https://doi.org/10.1016/j.ijhydene.2015.03.004 (https://doi.org/10.1016/j.ijhydene.2015.03.004).
CrossRef (https://doi.org/10.1016/j.ijhydene.2015.03.004)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Role%20of%20power-to-gas%20in%20an%20integrated%20gas%20and%20electricity%20system%20in%20Great%20Britain&author=M.%20Qadrdan&author=M.%20Abeysekera&author=M.%20Chaudry&author=J.%20Wu&author=N.%20Jenkins&journal=Int%20J%20Hydrog%20Energy&volume=40&issue=17&pages=5763-5775&publication_year=2015&doi=10.1016%2Fj.ijhydene.2015.03.004)

28. Sun G, Chen S, Wei Z, Chen S. Multi-period integrated natural gas and electric power system probabilistic optimal power flow incorporating power-to-gas units. J Mod Power Syst Clean Energy. 2017;5(3):412–23. https://doi.org/10.1007/s40565-017-0276-1 (https://doi.org/10.1007/s40565-017-0276-1).
CrossRef (https://doi.org/10.1007/s40565-017-0276-1)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Multi-period%20integrated%20natural%20gas%20and%20electric%20power%20syste

m%20probabilistic%20optimal%20power%20flow%20incorporating%20power-to-gas%20units&author=G.%20Sun&author=S.%20Chen&author=Z.%20Wei&author=S.%20Chen&journal=J%20Mod%20Power%20Syst%20Clean%20Energy&volume=5&issue=3&pages=412-423&publication_year=2017&doi=10.1007%2Fs40565-017-0276-1)

29. Liu C, Shahidehpour M, Fu Y, Li Z. Security-constrained unit commitment with natural gas transmission constraints. IEEE Trans Power Syst. 2009;24:1523–36. https://doi.org/10.1109/TPWRS.2009.2023262 (https://doi.org/10.1109/TPWRS.2009.2023262).
CrossRef (https://doi.org/10.1109/TPWRS.2009.2016362)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Security-constrained%20unit%20commitment%20with%20natural%20gas%20transmission%20constraints&author=C.%20Liu&author=M.%20Shahidehpour&author=Y.%20Fu&author=Z.%20Li&journal=IEEE%20Trans%20Power%20Syst&volume=24&pages=1523-1536&publication_year=2009&doi=10.1109%2FTPWRS.2009.2023262)

30. Alabdulwahab A, Abusorrah A, Zhang X, Shahidehpour M. Coordination of interdependent natural gas and electricity infrastructures for firming the variability of wind energy in stochastic day-ahead scheduling. IEEE Trans Sustain Energy. 2015;6(2):606–15. https://doi.org/10.1109/TSTE.2015.2399855 (https://doi.org/10.1109/TSTE.2015.2399855).
CrossRef (https://doi.org/10.1109/TSTE.2015.2399855)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Coordination%20of%20interdependent%20natural%20gas%20and%20electricity%20infrastructures%20for%20firming%20the%20variability%20of%20wind%20energy%20in%20stochastic%20day-ahead%20scheduling&author=A.%20Alabdulwahab&author=A.%20Abusorrah&author=X.%20Zhang&author=M.%20Shahidehpour&journal=IEEE%20Trans%20Sustain%20Energy&volume=6&issue=2&pages=606-615&publication_year=2015&doi=10.1109%2FTSTE.2015.2399855)

31. Zhang X, Shahidehpour M, Alabdulwahab A, Abusorrah A. Hourly electricity demand response in the stochastic day-ahead scheduling of coordinated electricity and natural gas networks. IEEE Trans Power Syst. 2016;31(1):592–601. https://doi.org/10.1109/TPWRS.2015.2390632 (https://doi.org/10.1109/TPWRS.2015.2390632).
CrossRef (https://doi.org/10.1109/TPWRS.2015.2390632)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Hourly%20electricity%20demand%20response%20in%20the%20stochastic%20day-ahead%20scheduling%20of%20coordinated%20electricity%20and%20natural%20gas%20networks&author=X.%20Zhang&author=M.%20Shahidehpour&author=A.%20Alabdulwahab&author=A.%20Abusorrah&journal=IEEE%20Trans%20Power%20Syst&volume=31&issue=1&pages=592-601&publication_year=2016&doi=10.1109%2FTPWRS.2015.2390632)

32. Zhao B, Conejo AJ, Sioshansi R. Unit commitment under gas-supply uncertainty and gas-price variability. IEEE Trans Power Syst. 2017;32(3):2394–405.

https://doi.org/10.1109/TPWRS.2016.2602659 (https://doi.org/10.1109/TPWRS.2016.2602659).
CrossRef (https://doi.org/10.1109/TPWRS.2016.2602659)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Unit%20commitment%20under%20gas-supply%20uncertainty%20and%20gas-price%20variability&author=B.%20Zhao&author=AJ.%20Conejo&author=R.%20Sioshansi&journal=IEEE%20Trans%20Power%20Syst&volume=32&issue=3&pages=2394-2405&publication_year=2017&doi=10.1109%2FTPWRS.2016.2602659)

33. Chertkov M, Fisher M, Backhaus S, Bent R, Misra S. Pressure fluctuations in natural gas networks caused by gas-electric coupling. 48th Hawaii Int Conf Syst Sci. 2015:2738–2747. https://doi.org/10.1109/HICSS.2015.330 (https://doi.org/10.1109/HICSS.2015.330).

34. Hejazi A, Mashhadi H. Effects of natural gas network on optimal operation of gas-fired power plants. 6th Conf Therm Power Plants. 2016:105–110. https://doi.org/10.1109/CTPP.2016.7483061 (https://doi.org/10.1109/CTPP.2016.7483061).

35. Behrooz H, Boozarjomehry R. Dynamic optimization of natural gas networks under customer demand uncertainties. Energy. 2017;134:968–83. https://doi.org/10.1016/j.energy.2017.06.087 (https://doi.org/10.1016/j.energy.2017.06.087).
CrossRef (https://doi.org/10.1016/j.energy.2017.06.087)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Dynamic%20optimization%20of%20natural%20gas%20networks%20under%20customer%20demand%20uncertainties&author=H.%20Behrooz&author=R.%20Boozarjomehry&journal=Energy&volume=134&pages=968-983&publication_year=2017&doi=10.1016%2Fj.energy.2017.06.087)

36. Qadrdan M, Wu J, Jenkins N, Ekanayake J. Operating strategies for a GB integrated gas and electricity network considering the uncertainty in wind power forecasts. IEEE Trans Sustain Energy. 2014;5(1):128–38. https://doi.org/10.1109/TSTE.2013.2274818 (https://doi.org/10.1109/TSTE.2013.2274818).
CrossRef (https://doi.org/10.1109/TSTE.2013.2274818)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Operating%20strategies%20for%20a%20GB%20integrated%20gas%20and%20electricity%20network%20considering%20the%20uncertainty%20in%20wind%20power%20forecasts&author=M.%20Qadrdan&author=J.%20Wu&author=N.%20Jenkins&author=J.%20Ekanayake&journal=IEEE%20Trans%20Sustain%20Energy&volume=5&issue=1&pages=128-138&publication_year=2014&doi=10.1109%2FTSTE.2013.2274818)

37. Odetayo B, MacCormack J, Rosehart W, Zareipour H. A sequential planning approach for distributed generation and natural gas networks. Energy. 2017;127:428–37. https://doi.org/10.1016/j.energy.2017.03.118 (https://doi.org/10.1016/j.energy.2017.03.118).
CrossRef (https://doi.org/10.1016/j.energy.2017.03.118)
Google Scholar (http://scholar.google.com/scholar_lookup?title=A%20sequential%20planning%20approach%20for%20distributed%20generation%20and%20natural%20gas%20networks&

author=B.%20Odetayo&author=J.%20MacCormack&author=W.%20Rosehart&
author=H.%20Zareipour&journal=Energy&volume=127&pages=428-437&
publication_year=2017&doi=10.1016%2Fj.energy.2017.03.118)

38. • Correa-posada C, Sánchez-martín P. Integrated power and natural gas model for energy adequacy in short-term operation. IEEE Trans Power Syst. 2015;30(**6**):3347–55. **This article provides a novel mixed-integer linear programing (MILP) formulation for short-term coordinated scheduling of the interdependent electricity and natural gas system while considering gas dynamics**. https://doi.org/10.1109/TPWRS.2014.2372013 (https://doi.org/10.1109/TPWRS.2014.2372013).
CrossRef (https://doi.org/10.1109/TPWRS.2014.2372013)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Integrated%20power%20and%20natural%20gas%20model%20for%20energy%20adequacy%20in%20short-term%20operation&author=C.%20Correa-posada&author=P.%20S%C3%A1nchez-mart%C3%ADn&journal=IEEE%20Trans%20Power%20Syst&volume=30&issue=6&pages=3347-3355&publication_year=2015&doi=10.1109%2FTPWRS.2014.2372013)

39. Zlotnik A, Roald L, Backhaus S, Chertkov M, Andersson G. Coordinated scheduling for interdependent electric power and natural gas infrastructures. IEEE Trans Power Syst. 2017;32(1):600–10. https://doi.org/10.1109/TPWRS.2016.2545522 (https://doi.org/10.1109/TPWRS.2016.2545522).
CrossRef (https://doi.org/10.1109/TPWRS.2016.2545522)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Coordinated%20scheduling%20for%20interdependent%20electric%20power%20and%20natural%20gas%20infrastructures&author=A.%20Zlotnik&author=L.%20Roald&author=S.%20Backhaus&author=M.%20Chertkov&author=G.%20Andersson&journal=IEEE%20Trans%20Power%20Syst&volume=32&issue=1&pages=600-610&publication_year=2017&doi=10.1109%2FTPWRS.2016.2545522)

40. Li G, Zhang R, Jiang T, Chen H, Bai L, Li X. Security-constrained bi-level economic dispatch model for integrated natural gas and electricity systems considering wind power and power-to-gas process. Appl Energy. 2016;194:696–704. https://doi.org/10.1016/j.apenergy.2016.07.077 (https://doi.org/10.1016/j.apenergy.2016.07.077).
CrossRef (https://doi.org/10.1016/j.apenergy.2016.07.077)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Security-constrained%20bi-level%20economic%20dispatch%20model%20for%20integrated%20natural%20gas%20and%20electricity%20systems%20considering%20wind%20power%20and%20power-to-gas%20process&author=G.%20Li&author=R.%20Zhang&author=T.%20Jiang&author=H.%20Chen&author=L.%20Bai&author=X.%20Li&journal=Appl%20Energy&volume=194&pages=696-704&publication_year=2016&doi=10.1016%2Fj.apenergy.2016.07.077)

41. Liu C, Shahidehpour M, Wang J. Application of augmented Lagrangian relaxation to coordinated scheduling of interdependent hydrothermal power and natural gas systems. IET Gener Transm Distrib. 2010;4(12):1314–25. https://doi.org/10.1049

/iet-gtd.2010.0151 (https://doi.org/10.1049/iet-gtd.2010.0151).
CrossRef (https://doi.org/10.1049/iet-gtd.2010.0151)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Application%20of%20augmented%20Lagrangian%20relaxation%20to%20coordinated%20scheduling%20of%20interdependent%20hydrothermal%20power%20and%20natural%20gas%20systems&author=C.%20Liu&author=M.%20Shahidehpour&author=J.%20Wang&journal=IET%20Gener%20Transm%20Distrib&volume=4&issue=12&pages=1314-1325&publication_year=2010&doi=10.1049%2Fiet-gtd.2010.0151)

42. Alkano D, Scherpen J. Distributed supply coordination for Power-to-Gas facilities embedded in energy grids. IEEE Trans Smart Grid. 2017. (to appear). https://doi.org/10.1109/TSG.2016.2574568. (https://doi.org/10.1109/TSG.2016.2574568.).

43. He C, Wu L, Liu T, Shahidehpour M. Robust co-optimization scheduling of electricity and natural gas systems via ADMM. IEEE Trans Sustain Energy. 2017;8(2):658–70. https://doi.org/10.1109/TSTE.2016.2615104 (https://doi.org/10.1109/TSTE.2016.2615104).
CrossRef (https://doi.org/10.1109/TSTE.2016.2615104)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Robust%20co-optimization%20scheduling%20of%20electricity%20and%20natural%20gas%20systems%20via%20ADMM&author=C.%20He&author=L.%20Wu&author=T.%20Liu&author=M.%20Shahidehpour&journal=IEEE%20Trans%20Sustain%20Energy&volume=8&issue=2&pages=658-670&publication_year=2017&doi=10.1109%2FTSTE.2016.2615104)

44. Wen Y, Qu X, Li W, Liu X, Ye X. Synergistic operation of electricity and natural gas networks via ADMM. IEEE Trans Smart Grid. 2017:1. https://doi.org/10.1109/TSG.2017.2663380 (https://doi.org/10.1109/TSG.2017.2663380). (to appear)

45. Qadrdan M, Chaudry M, Wu J, Jenkins N, Ekanayake J. Impact of a large penetration of wind generation on the GB gas network. Energy Policy. 2010;38(10):5684–95. https://doi.org/10.1016/j.enpol.2010.05.016 (https://doi.org/10.1016/j.enpol.2010.05.016).
CrossRef (https://doi.org/10.1016/j.enpol.2010.05.016)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Impact%20of%20a%20large%20penetration%20of%20wind%20generation%20on%20the%20GB%20gas%20network&author=M.%20Qadrdan&author=M.%20Chaudry&author=J.%20Wu&author=N.%20Jenkins&author=J.%20Ekanayake&journal=Energy%20Policy&volume=38&issue=10&pages=5684-5695&publication_year=2010&doi=10.1016%2Fj.enpol.2010.05.016)

46. Sahin C, Li Z, Shahidehpour M, Erkmen I. Impact of natural gas system on risk-constrained midterm hydrothermal scheduling. IEEE Trans Power Syst. 2011;26(2):520–31. https://doi.org/10.1109/TPWRS.2010.2052838 (https://doi.org/10.1109/TPWRS.2010.2052838).
CrossRef (https://doi.org/10.1109/TPWRS.2010.2052838)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Impact%20of%20natural%20gas%20system%20on%20ris

k-constrained%20midterm%20hydrothermal%20scheduling&author=C.%20Sahin&author=Z.%20Li&author=M.%20Shahidehpour&author=I.%20Erkmen&journal=IEEE%20Trans%20Power%20Syst&volume=26&issue=2&pages=520-531&publication_year=2011&doi=10.1109%2FTPWRS.2010.2052838)

47. Wu L, Shahidehpour M. Optimal coordination of stochastic hydro and natural gas supplies in midterm operation of power systems. IET Gener Transm Distrib. 2011;5(5):577–87. https://doi.org/10.1049/iet-gtd.2010.0215 (https://doi.org/10.1049/iet-gtd.2010.0215).
CrossRef (https://doi.org/10.1049/iet-gtd.2010.0215)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Optimal%20coordination%20of%20stochastic%20hydro%20and%20natural%20gas%20supplies%20in%20midterm%20operation%20of%20power%20systems&author=L.%20Wu&author=M.%20Shahidehpour&journal=IET%20Gener%20Transm%20Distrib&volume=5&issue=5&pages=577-587&publication_year=2011&doi=10.1049%2Fiet-gtd.2010.0215)

48. Behbahani-Nejad M, Bagheri A. The accuracy and efficiency of a MATLAB-Simulink library for transient flow simulation of gas pipelines and networks. J Pet Sci Eng. 2010;70(3–4):256–65. https://doi.org/10.1016/j.petrol.2009.11.018 (https://doi.org/10.1016/j.petrol.2009.11.018).
CrossRef (https://doi.org/10.1016/j.petrol.2009.11.018)
Google Scholar (http://scholar.google.com/scholar_lookup?title=The%20accuracy%20and%20efficiency%20of%20a%20MATLAB-Simulink%20library%20for%20transient%20flow%20simulation%20of%20gas%20pipelines%20and%20networks&author=M.%20Behbahani-Nejad&author=A.%20Bagheri&journal=J%20Pet%20Sci%20Eng&volume=70&issue=3%E2%80%934&pages=256-265&publication_year=2010&doi=10.1016%2Fj.petrol.2009.11.018)

49. Pambour K, Cakir Erdener B, Bolado-Lavin R, Dijkema G. SAInt-A novel quasi-dynamic model for assessing security of supply in coupled gas and electricity transmission networks. Appl Energy. 2017;203:829–57. https://doi.org/10.1016/j.apenergy.2017.05.142 (https://doi.org/10.1016/j.apenergy.2017.05.142).
CrossRef (https://doi.org/10.1016/j.apenergy.2017.05.142)
Google Scholar (http://scholar.google.com/scholar_lookup?title=SAInt-A%20novel%20quasi-dynamic%20model%20for%20assessing%20security%20of%20supply%20in%20coupled%20gas%20and%20electricity%20transmission%20networks&author=K.%20Pambour&author=B.%20Cakir%20Erdener&author=R.%20Bolado-Lavin&author=G.%20Dijkema&journal=Appl%20Energy&volume=203&pages=829-857&publication_year=2017&doi=10.1016%2Fj.apenergy.2017.05.142)

50. Clegg S, Mancarella P. Integrated modeling and assessment of the operational impact of power-to-gas (P2G) on electrical and gas transmission networks. IEEE Trans Sustain Energy. 2015;6(4):1234–44. https://doi.org/10.1109/TSTE.2015.2424885 (https://doi.org/10.1109/TSTE.2015.2424885).
CrossRef (https://doi.org/10.1109/TSTE.2015.2424885)
Google Scholar (http://scholar.google.com

/scholar_lookup?title=Integrated%20modeling%20and%20assessment%20of%20the%20operational%20impact%20of%20power-to-gas%20%28P2G%29%20on%20electrical%20and%20gas%20transmission%20networks&author=S.%20Clegg&author=P.%20Mancarella&journal=IEEE%20Trans%20Sustain%20Energy&volume=6&issue=4&pages=1234-1244&publication_year=2015&doi=10.1109%2FTSTE.2015.2424885)

51. Yang J, Zhang N, Kang C, Xia Q. Effect of natural gas flow dynamics in robust generation scheduling under wind uncertainty. IEEE Trans Power Syst. 2017:1. https://doi.org/10.1109/TPWRS.2017.2733222 (https://doi.org/10.1109/TPWRS.2017.2733222). (to appear)

52. Fang J, Zeng Q, Ai X, Chen Z, Wen J. Dynamic optimal energy flow in the integrated natural gas and electrical power systems. IEEE Trans Sustain Energy. 2017;9(1):188–98. https://doi.org/10.1109/TSTE.2017.2717600 (https://doi.org/10.1109/TSTE.2017.2717600).

53. Kamalinia S, Wu L, Member S, Shahidehpour M. Stochastic midterm coordination of hydro and natural gas flexibilities for wind energy integration. IEEE Trans Sustain Energy. 2014;5(4):1070–9. https://doi.org/10.1109/TSTE.2014.2326821 (https://doi.org/10.1109/TSTE.2014.2326821).
CrossRef (https://doi.org/10.1109/TSTE.2014.2326821)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Stochastic%20midterm%20coordination%20of%20hydro%20and%20natural%20gas%20flexibilities%20for%20wind%20energy%20integration&author=S.%20Kamalinia&author=L.%20Wu&author=S.%20Member&author=M.%20Shahidehpour&journal=IEEE%20Trans%20Sustain%20Energy&volume=5&issue=4&pages=1070-1079&publication_year=2014&doi=10.1109%2FTSTE.2014.2326821)

54. Zhang X, Che L, Shahidehpour M. Impact of natural gas system on short-term scheduling with volatile renewable energy. 2015 I.E. Power Energy Soc Gen Meet. 2015;2015:1–5. https://doi.org/10.1109/PESGM.2015.7285633 (https://doi.org/10.1109/PESGM.2015.7285633).

55. Qiao Z, Guo Q, Sun H, Pan Z, Liu Y, Xiong W. An interval gas flow analysis in natural gas and electricity coupled networks considering the uncertainty of wind power. Appl Energy. 2017;201:343–53. https://doi.org/10.1016/j.apenergy.2016.12.020 (https://doi.org/10.1016/j.apenergy.2016.12.020).
CrossRef (https://doi.org/10.1016/j.apenergy.2016.12.020)
Google Scholar (http://scholar.google.com/scholar_lookup?title=An%20interval%20gas%20flow%20analysis%20in%20natural%20gas%20and%20electricity%20coupled%20networks%20considering%20the%20uncertainty%20of%20wind%20power&author=Z.%20Qiao&author=Q.%20Guo&author=H.%20Sun&author=Z.%20Pan&author=Y.%20Liu&author=W.%20Xiong&journal=Appl%20Energy&volume=201&pages=343-353&publication_year=2017&doi=10.1016%2Fj.apenergy.2016.12.020)

56. Hu Y, Lian H, Bie Z, Zhou B. Unified probabilistic gas and power flow. J Mod Power Syst Clean Energy. 2017;5(3):400–11. https://doi.org/10.1007/s40565-017-0284-1 (https://doi.org/10.1007/s40565-017-0284-1).
CrossRef (https://doi.org/10.1007/s40565-017-0284-1)

Google Scholar (http://scholar.google.com/scholar_lookup?title=Unified%20probabilistic%20gas%20and%20power%20flow&author=Y.%20Hu&author=H.%20Lian&author=Z.%20Bie&author=B.%20Zhou&journal=J%20Mod%20Power%20Syst%20Clean%20Energy&volume=5&issue=3&pages=400-411&publication_year=2017&doi=10.1007%2Fs40565-017-0284-1)

57. Zhang X, Che L, Shahidehpour M, Alabdulwahab A, Abusorrah A. Electricity-natural gas operation planning with hourly demand response for deployment of flexible ramp. IEEE Trans Sustain Energy. 2016;7(3):996–1004. https://doi.org/10.1109/TSTE.2015.2511140 (https://doi.org/10.1109/TSTE.2015.2511140).
CrossRef (https://doi.org/10.1109/TSTE.2015.2511140)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Electricity-natural%20gas%20operation%20planning%20with%20hourly%20demand%20response%20for%20deployment%20of%20flexible%20ramp&author=X.%20Zhang&author=L.%20Che&author=M.%20Shahidehpour&author=A.%20Alabdulwahab&author=A.%20Abusorrah&journal=IEEE%20Trans%20Sustain%20Energy&volume=7&issue=3&pages=996-1004&publication_year=2016&doi=10.1109%2FTSTE.2015.2511140)

58. Correa-Posada C, Sanchez-Martion P. Gas network optimization: a comparison of piecewise linear models. 2014. [Online]. Available: http://www.optimization-online.org/DB_FILE/2014/10/4580.pdf (http://www.optimization-online.org/DB_FILE/2014/10/4580.pdf)

59. Sirvent M, Kanelakis N, Geißler B, Biskas P. Linearized model for optimization of coupled electricity and natural gas systems. J Mod Power Syst Clean Energy. 2017;5(3):364–74. https://doi.org/10.1007/s40565-017-0275-2 (https://doi.org/10.1007/s40565-017-0275-2).
CrossRef (https://doi.org/10.1007/s40565-017-0275-2)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Linearized%20model%20for%20optimization%20of%20coupled%20electricity%20and%20natural%20gas%20systems&author=M.%20Sirvent&author=N.%20Kanelakis&author=B.%20Gei%C3%9Fler&author=P.%20Biskas&journal=J%20Mod%20Power%20Syst%20Clean%20Energy&volume=5&issue=3&pages=364-374&publication_year=2017&doi=10.1007%2Fs40565-017-0275-2)

60. Urbina M, Li Z. A combined model for analyzing the interdependency of electrical and gas systems. 39th North Am Power Symp NAPS 2007:468–472. https://doi.org/10.1109/NAPS.2007.4402351 (https://doi.org/10.1109/NAPS.2007.4402351).

61. Chen S, Wei Z, Sun G, Sun Y, Zang H, Zhu Y. Optimal power and gas flow with a limited number of control actions. IEEE Trans Smart Grid. 2017; (to appear). https://doi.org/10.1109/TSG.2017.2687621 (https://doi.org/10.1109/TSG.2017.2687621).

62. Correa-Posada C, Sánchez-Martín P, Lumbreras S. Security-constrained model for integrated power and natural-gas system. J Mod Power Syst Clean Energy. 2017;5(3):326–36. https://doi.org/10.1007/s40565-017-0287-y (https://doi.org/10.1007/s40565-017-0287-y).

CrossRef (https://doi.org/10.1007/s40565-017-0287-y)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Security-constrained%20model%20for%20integrated%20power%20and%20natural-gas%20system&author=C.%20Correa-Posada&author=P.%20S%C3%A1nchez-Mart%C3%ADn&author=S.%20Lumbreras&journal=J%20Mod%20Power%20Syst%20Clean%20Energy&volume=5&issue=3&pages=326-336&publication_year=2017&doi=10.1007%2Fs40565-017-0287-y)

63. Correa-Posada C, Sánchez-Martin P. Security-constrained optimal power and natural-gas flow. IEEE Trans Power Syst. 2014;29(4):1780–7. https://doi.org/10.1109/TPWRS.2014.2299714 (https://doi.org/10.1109/TPWRS.2014.2299714).
CrossRef (https://doi.org/10.1109/TPWRS.2014.2299714)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Security-constrained%20optimal%20power%20and%20natural-gas%20flow&author=C.%20Correa-Posada&author=P.%20S%C3%A1nchez-Martin&journal=IEEE%20Trans%20Power%20Syst&volume=29&issue=4&pages=1780-1787&publication_year=2014&doi=10.1109%2FTPWRS.2014.2299714)

64. Liu C, Lee C, Shahidehpour M. Look ahead robust scheduling of wind-thermal system with considering natural gas congestion. IEEE Trans Power Syst. 2015;30(1):544–5. https://doi.org/10.1109/TPWRS.2014.2326981 (https://doi.org/10.1109/TPWRS.2014.2326981).
CrossRef (https://doi.org/10.1109/TPWRS.2014.2326981)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Look%20ahead%20robust%20scheduling%20of%20wind-thermal%20system%20with%20considering%20natural%20gas%20congestion&author=C.%20Liu&author=C.%20Lee&author=M.%20Shahidehpour&journal=IEEE%20Trans%20Power%20Syst&volume=30&issue=1&pages=544-545&publication_year=2015&doi=10.1109%2FTPWRS.2014.2326981)

65. Bai L, Li F, Cui H, Jiang T, Sun H, Zhu J. Interval optimization based operating strategy for gas-electricity integrated energy systems considering demand response and wind uncertainty. Appl Energy. 2016;167:270–9. https://doi.org/10.1016/j.apenergy.2015.10.119 (https://doi.org/10.1016/j.apenergy.2015.10.119).
CrossRef (https://doi.org/10.1016/j.apenergy.2015.10.119)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Interval%20optimization%20based%20operating%20strategy%20for%20gas-electricity%20integrated%20energy%20systems%20considering%20demand%20response%20and%20wind%20uncertainty&author=L.%20Bai&author=F.%20Li&author=H.%20Cui&author=T.%20Jiang&author=H.%20Sun&author=J.%20Zhu&journal=Appl%20Energy&volume=167&pages=270-279&publication_year=2016&doi=10.1016%2Fj.apenergy.2015.10.119)

66. Kou Y, Zheng J, Li Z, Wu Q. Many-objective optimization for coordinated operation of integrated electricity and gas network. J Mod Power Syst Clean Energy. 2017;5(3):350–63. https://doi.org/10.1007/s40565-017-0279-y (https://doi.org/10.1007/s40565-017-0279-y).

CrossRef (https://doi.org/10.1007/s40565-017-0279-y)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Many-objective%20optimization%20for%20coordinated%20operation%20of%20integrated%20electricity%20and%20gas%20network&author=Y.%20Kou&author=J.%20Zheng&author=Z.%20Li&author=Q.%20Wu&journal=J%20Mod%20Power%20Syst%20Clean%20Energy&volume=5&issue=3&pages=350-363&publication_year=2017&doi=10.1007%2Fs40565-017-0279-y)

67. Sardou I, Khodayar M, Ameli M. Coordinated operation of natural gas and electricity networks with microgrid aggregators. IEEE Trans Smart Grid. 2017; (to appear). https://doi.org/10.1109/TSG.2016.2547965 (https://doi.org/10.1109/TSG.2016.2547965).

68. Costa D, Nunes M, Vieira J, Bezerra U. Decision tree-based security dispatch application in integrated electric power and natural-gas networks. Electr Power Syst Res. 2016;141:442–29. https://doi.org/10.1016/j.epsr.2016.08.027 (https://doi.org/10.1016/j.epsr.2016.08.027).
CrossRef (https://doi.org/10.1016/j.epsr.2016.08.027)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Decision%20tree-based%20security%20dispatch%20application%20in%20integrated%20electric%20power%20and%20natural-gas%20networks&author=D.%20Costa&author=M.%20Nunes&author=J.%20Vieira&author=U.%20Bezerra&journal=Electr%20Power%20Syst%20Res&volume=141&pages=442-429&publication_year=2016&doi=10.1016%2Fj.epsr.2016.08.027)

69. Bai L, Li F, Jiang T, Jia H. Robust scheduling for wind integrated energy systems considering gas pipeline and power transmission N-1 contingencies. IEEE Trans Power Syst. 2017;32:1582–4. https://doi.org/10.1109/TPWRS.2016.2582684 (https://doi.org/10.1109/TPWRS.2016.2582684).
Google Scholar (http://scholar.google.com/scholar_lookup?title=Robust%20scheduling%20for%20wind%20integrated%20energy%20systems%20considering%20gas%20pipeline%20and%20power%20transmission%20N-1%20contingencies&author=L.%20Bai&author=F.%20Li&author=T.%20Jiang&author=H.%20Jia&journal=IEEE%20Trans%20Power%20Syst&volume=32&pages=1582-1584&publication_year=2017&doi=10.1109%2FTPWRS.2016.2582684)

70. Ameli H, Qadrdan M, Strbac G. Value of gas network infrastructure flexibility in supporting cost effective operation of power systems. Appl Energy. 2017;202:571–80. https://doi.org/10.1016/j.apenergy.2017.05.132 (https://doi.org/10.1016/j.apenergy.2017.05.132).
CrossRef (https://doi.org/10.1016/j.apenergy.2017.05.132)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Value%20of%20gas%20network%20infrastructure%20flexibility%20in%20supporting%20cost%20effective%20operation%20of%20power%20systems&author=H.%20Ameli&author=M.%20Qadrdan&author=G.%20Strbac&journal=Appl%20Energy&volume=202&pages=571-580&publication_year=2017&doi=10.1016%2Fj.apenergy.2017.05.132)

71. Devlin J, Li K, Higgins P, Foley A. A multi vector energy analysis for

interconnected power and gas systems. Appl Energy. 2017;192:315–28. https://doi.org/10.1016/j.apenergy.2016.08.040 (https://doi.org/10.1016/j.apenergy.2016.08.040).
CrossRef (https://doi.org/10.1016/j.apenergy.2016.08.040)
Google Scholar (http://scholar.google.com/scholar_lookup?title=A%20multi%20vector%20energy%20analysis%20for%20interconnected%20power%20and%20gas%20systems&author=J.%20Devlin&author=K.%20Li&author=P.%20Higgins&author=A.%20Foley&journal=Appl%20Energy&volume=192&pages=315-328&publication_year=2017&doi=10.1016%2Fj.apenergy.2016.08.040)

72. Chen S, Wei Z, Sun G, Cheung K, Wang D. Identifying optimal energy flow solvability in electricity-gas integrated energy systems. IEEE Trans Sustain Energy. 2017;8(2):846–54. https://doi.org/10.1109/TSTE.2016.2623631 (https://doi.org/10.1109/TSTE.2016.2623631).
CrossRef (https://doi.org/10.1109/TSTE.2016.2623631)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Identifying%20optimal%20energy%20flow%20solvability%20in%20electricity-gas%20integrated%20energy%20systems&author=S.%20Chen&author=Z.%20Wei&author=G.%20Sun&author=K.%20Cheung&author=D.%20Wang&journal=IEEE%20Trans%20Sustain%20Energy&volume=8&issue=2&pages=846-854&publication_year=2017&doi=10.1109%2FTSTE.2016.2623631)

73. Chen S, Wei Z, Sun G, Cheung K, Sun Y. Multi-linear probabilistic energy flow analysis of integrated electrical and natural-gas systems. IEEE Trans Power Syst. 2017;32(3):1970–9. https://doi.org/10.1109/TPWRS.2016.2597162 (https://doi.org/10.1109/TPWRS.2016.2597162).
CrossRef (https://doi.org/10.1109/TPWRS.2016.2597162)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Multi-linear%20probabilistic%20energy%20flow%20analysis%20of%20integrated%20electrical%20and%20natural-gas%20systems&author=S.%20Chen&author=Z.%20Wei&author=G.%20Sun&author=K.%20Cheung&author=Y.%20Sun&journal=IEEE%20Trans%20Power%20Syst&volume=32&issue=3&pages=1970-1979&publication_year=2017&doi=10.1109%2FTPWRS.2016.2597162)

74. Qadrdan M, Chaudry M, Jenkins N, Baruah P, Eyre N. Impact of transition to a low carbon power system on the GB gas network. Appl Energy. 2015;151:1–12. https://doi.org/10.1016/j.apenergy.2015.04.056 (https://doi.org/10.1016/j.apenergy.2015.04.056).
CrossRef (https://doi.org/10.1016/j.apenergy.2015.04.056)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Impact%20of%20transition%20to%20a%20low%20carbon%20power%20system%20on%20the%20GB%20gas%20network&author=M.%20Qadrdan&author=M.%20Chaudry&author=N.%20Jenkins&author=P.%20Baruah&author=N.%20Eyre&journal=Appl%20Energy&volume=151&pages=1-12&publication_year=2015&doi=10.1016%2Fj.apenergy.2015.04.056)

75. Unsihuay C, Marangon-Lima J, de Souza A. Integrated power generation and natural gas expansion planning. IEEE Lausanne Power Tech. 2007;2007:1404–9.

https://doi.org/10.1109/PCT.2007.4538521 (https://doi.org/10.1109/PCT.2007.4538521).
CrossRef (https://doi.org/10.1109/PCT.2007.4538521)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Integrated%20power%20generation%20and%20natural%20gas%20expansion%20planning&author=C.%20Unsihuay&author=J.%20Marangon-Lima&author=A.%20Souza&journal=IEEE%20Lausanne%20Power%20Tech&volume=2007&pages=1404-1409&publication_year=2007&doi=10.1109%2FPCT.2007.4538521)

76. Chaudry M, Jenkins N, Qadrdan M, Wu J. Combined gas and electricity network expansion planning. Appl Energy. 2014;113:1171–87. https://doi.org/10.1016/j.apenergy.2013.08.071 (https://doi.org/10.1016/j.apenergy.2013.08.071).
CrossRef (https://doi.org/10.1016/j.apenergy.2013.08.071)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Combined%20gas%20and%20electricity%20network%20expansion%20planning&author=M.%20Chaudry&author=N.%20Jenkins&author=M.%20Qadrdan&author=J.%20Wu&journal=Appl%20Energy&volume=113&pages=1171-1187&publication_year=2014&doi=10.1016%2Fj.apenergy.2013.08.071)

77. Unsihuay-Vila C, Marangon-Lima J, De Souza A, Perez-Arriaga I, Balestrassi P. A model to long-term, multiarea, multistage, and integrated expansion planning of electricity and natural gas systems. IEEE Trans Power Syst. 2010;25(2):1154–68. https://doi.org/10.1109/TPWRS.2009.2036797 (https://doi.org/10.1109/TPWRS.2009.2036797).
CrossRef (https://doi.org/10.1109/TPWRS.2009.2036797)
Google Scholar (http://scholar.google.com/scholar_lookup?title=A%20model%20to%20long-term%2C%20multiarea%2C%20multistage%2C%20and%20integrated%20expansion%20planning%20of%20electricity%20and%20natural%20gas%20systems&author=C.%20Unsihuay-Vila&author=J.%20Marangon-Lima&author=A.%20Souza&author=I.%20Perez-Arriaga&author=P.%20Balestrassi&journal=IEEE%20Trans%20Power%20Syst&volume=25&issue=2&pages=1154-1168&publication_year=2010&doi=10.1109%2FTPWRS.2009.2036797)

78. Barati F, Seifi H, Sepasian M, Nateghi A, Shafie-khah M, Catalao J. Multi-period integrated framework of generation, transmission, and natural gas grid expansion planning for large-scale systems. IEEE Trans Power Syst. 2015;30:2527–37. https://doi.org/10.1109/TPWRS.2014.2365705 (https://doi.org/10.1109/TPWRS.2014.2365705).
CrossRef (https://doi.org/10.1109/TPWRS.2014.2365705)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Multi-period%20integrated%20framework%20of%20generation%2C%20transmission%2C%20and%20natural%20gas%20grid%20expansion%20planning%20for%20large-scale%20systems&author=F.%20Barati&author=H.%20Seifi&author=M.%20Sepasian&author=A.%20Nateghi&author=M.%20Shafie-khah&author=J.%20Catalao&journal=IEEE%20Trans%20Power%20Syst&volume=30&pages=2527-2537&publication_year=2015&doi=10.1109%2FTPWRS.2014.2365705)

79. Qiu J, Dong Z, Zhao J, Meng K, Zheng Y, Hill D. Low carbon oriented expansion planning of integrated gas and power systems. IEEE Trans Power Syst. 2015;30(2):1035–46. https://doi.org/10.1109/TPWRS.2014.2369011 (https://doi.org/10.1109/TPWRS.2014.2369011).
CrossRef (https://doi.org/10.1109/TPWRS.2014.2369011)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Low%20carbon%20oriented%20expansion%20planning%20of%20integrated%20gas%20and%20power%20systems&author=J.%20Qiu&author=Z.%20Dong&author=J.%20Zhao&author=K.%20Meng&author=Y.%20Zheng&author=D.%20Hill&journal=IEEE%20Trans%20Power%20Syst&volume=30&issue=2&pages=1035-1046&publication_year=2015&doi=10.1109%2FTPWRS.2014.2369011)

80. Qiu J, Yang H, Dong Z, Zhao J, Meng K, Luo F, et al. A linear programming approach to expansion co-planning in gas and electricity markets. IEEE Trans Power Syst. 2016;31(5):3594–606. https://doi.org/10.1109/TPWRS.2015.2496203 (https://doi.org/10.1109/TPWRS.2015.2496203).
CrossRef (https://doi.org/10.1109/TPWRS.2015.2496203)
Google Scholar (http://scholar.google.com/scholar_lookup?title=A%20linear%20programming%20approach%20to%20expansion%20co-planning%20in%20gas%20and%20electricity%20markets&author=J.%20Qiu&author=H.%20Yang&author=Z.%20Dong&author=J.%20Zhao&author=K.%20Meng&author=F.%20Luo&author=K.%20Wang&journal=IEEE%20Trans%20Power%20Syst&volume=31&issue=5&pages=3594-3606&publication_year=2016&doi=10.1109%2FTPWRS.2015.2496203)

81. Sanchez C, Bent R, Backhaus S, Blumsack S, Hijazi H, Hentenryck P Van. Convex optimization for joint expansion planning of natural gas and power systems. 49th Hawaii Int Conf Syst Sci. 2016; 2536–45. https://doi.org/10.1109/HICSS.2016.317 (https://doi.org/10.1109/HICSS.2016.317).

82. Barati F, Seifi H, Nateghi A, Sepasian M, Shafie-khah M, Catalao J. An integrated generation, transmission and natural gas grid expansion planning approach for large scale systems. IEEE Power Energy Soc Gen Meet. 2015;30:1–5. https://doi.org/10.1109/PESGM.2015.7286535 (https://doi.org/10.1109/PESGM.2015.7286535).
Google Scholar (http://scholar.google.com/scholar_lookup?title=An%20integrated%20generation%2C%20transmission%20and%20natural%20gas%20grid%20expansion%20planning%20approach%20for%20large%20scale%20systems&author=F.%20Barati&author=H.%20Seifi&author=A.%20Nateghi&author=M.%20Sepasian&author=M.%20Shafie-khah&author=J.%20Catalao&journal=IEEE%20Power%20Energy%20Soc%20Gen%20Meet&volume=30&pages=1-5&publication_year=2015&doi=10.1109%2FPESGM.2015.7286535)

83. Hu Y, Bie Z, Ding T, Lin Y. An NSGA-II based multi-objective optimization for combined gas and electricity network expansion planning. Appl Energy. 2016;167:280–93. https://doi.org/10.1016/j.apenergy.2015.10.148 (https://doi.org/10.1016/j.apenergy.2015.10.148).

CrossRef (https://doi.org/10.1016/j.apenergy.2015.10.148)
Google Scholar (http://scholar.google.com/scholar_lookup?title=An%20NSGA-II%20based%20multi-objective%20optimization%20for%20combined%20gas%20and%20electricity%20network%20expansion%20planning&author=Y.%20Hu&author=Z.%20Bie&author=T.%20Ding&author=Y.%20Lin&journal=Appl%20Energy&volume=167&pages=280-293&publication_year=2016&doi=10.1016%2Fj.apenergy.2015.10.148)

84. Leite da Silva A, Rezende L, Manso L, Anders G. Transmission expansion planning: a discussion on reliability and N-1 security criteria. IEEE 11th Int. Conf. Probabilistic Methods Appl to Power Syst. 2010; 244–251. https://doi.org/10.1109/PMAPS.2010.5528652 (https://doi.org/10.1109/PMAPS.2010.5528652).

85. Qiu J, Dong Z, Zhao J, Meng K, Luo F, Chen Y. Expansion co-planning for shale gas integration in a combined energy market. J Mod Power Syst Clean Energy. 2015;3(3):302–11. https://doi.org/10.1007/s40565-015-0107-1 (https://doi.org/10.1007/s40565-015-0107-1).
CrossRef (https://doi.org/10.1007/s40565-015-0107-1)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Expansion%20co-planning%20for%20shale%20gas%20integration%20in%20a%20combined%20energy%20market&author=J.%20Qiu&author=Z.%20Dong&author=J.%20Zhao&author=K.%20Meng&author=F.%20Luo&author=Y.%20Chen&journal=J%20Mod%20Power%20Syst%20Clean%20Energy&volume=3&issue=3&pages=302-311&publication_year=2015&doi=10.1007%2Fs40565-015-0107-1)

86. Wang D, Qiu J, Meng K, Gao X, Dong Z. Coordinated expansion co-planning of integrated gas and power systems. J Mod Power Syst Clean Energy. 2017;5(3):314–25. https://doi.org/10.1007/s40565-017-0286-z (https://doi.org/10.1007/s40565-017-0286-z).
CrossRef (https://doi.org/10.1007/s40565-017-0286-z)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Coordinated%20expansion%20co-planning%20of%20integrated%20gas%20and%20power%20systems&author=D.%20Wang&author=J.%20Qiu&author=K.%20Meng&author=X.%20Gao&author=Z.%20Dong&journal=J%20Mod%20Power%20Syst%20Clean%20Energy&volume=5&issue=3&pages=314-325&publication_year=2017&doi=10.1007%2Fs40565-017-0286-z)

87. Zhang X, Shahidehpour M, Alabdulwahab A, Abusorrah A. Security-constrained co-optimization planning of electricity and natural gas transportation infrastructures. IEEE Trans Power Syst. 2015;30:2984–93. https://doi.org/10.1109/TPWRS.2014.2369486 (https://doi.org/10.1109/TPWRS.2014.2369486).
CrossRef (https://doi.org/10.1109/TPWRS.2014.2369486)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Security-constrained%20co-optimization%20planning%20of%20electricity%20and%20natural%20gas%20tra

nsportation%20infrastructures&author=X.%20Zhang&author=M.%20Shahidehpour&author=A.%20Alabdulwahab&author=A.%20Abusorrah&journal=IEEE%20Trans%20Power%20Syst&volume=30&pages=2984-2993&publication_year=2015&doi=10.1109%2FTPWRS.2014.2369486)

88. Zhang X, Che L, Shahidehpour M, Alabdulwahab A, Abusorrah A. Reliability-based optimal planning of electricity and natural gas interconnections for multiple energy hubs. IEEE Trans Smart Grid. 2017;8(4):1658–67. https://doi.org/10.1109/TSG.2015.2498166 (https://doi.org/10.1109/TSG.2015.2498166). CrossRef (https://doi.org/10.1109/TSG.2015.2498166) Google Scholar (http://scholar.google.com/scholar_lookup?title=Reliability-based%20optimal%20planning%20of%20electricity%20and%20natural%20gas%20interconnections%20for%20multiple%20energy%20hubs&author=X.%20Zhang&author=L.%20Che&author=M.%20Shahidehpour&author=A.%20Alabdulwahab&author=A.%20Abusorrah&journal=IEEE%20Trans%20Smart%20Grid&volume=8&issue=4&pages=1658-1667&publication_year=2017&doi=10.1109%2FTSG.2015.2498166)

89. Qiu J, Dong Z, Zhao J, Xu Y, Zheng Y, Li C, et al. Multi-stage flexible expansion co-planning under uncertainties in a combined electricity and gas market. IEEE Trans Power Syst. 2015;30(4):2119–29. https://doi.org/10.1109/TPWRS.2014.2358269 (https://doi.org/10.1109/TPWRS.2014.2358269). CrossRef (https://doi.org/10.1109/TPWRS.2014.2358269) Google Scholar (http://scholar.google.com/scholar_lookup?title=Multi-stage%20flexible%20expansion%20co-planning%20under%20uncertainties%20in%20a%20combined%20electricity%20and%20gas%20market&author=J.%20Qiu&author=Z.%20Dong&author=J.%20Zhao&author=Y.%20Xu&author=Y.%20Zheng&author=C.%20Li&author=K.%20Wang&journal=IEEE%20Trans%20Power%20Syst&volume=30&issue=4&pages=2119-2129&publication_year=2015&doi=10.1109%2FTPWRS.2014.2358269)

90. Ding T, Hu Y, Bie Z. Multi-stage stochastic programming with nonanticipativity constraints for expansion of combined power and natural gas systems. IEEE Trans Power Syst 2018;33(1):317–28. https://doi.org/10.1109/TPWRS.2017.2701881 (https://doi.org/10.1109/TPWRS.2017.2701881).

91. Shao C, Shahidehpour M, Wang X, Wang X, Wang B. Integrated planning of electricity and natural gas transportation systems for enhancing the power grid resilience. IEEE Trans Power Syst. 2017; (to appear);32(6):4418–29. https://doi.org/10.1109/TPWRS.2017.2672728 (https://doi.org/10.1109/TPWRS.2017.2672728). CrossRef (https://doi.org/10.1109/TPWRS.2017.2672728) Google Scholar (http://scholar.google.com/scholar_lookup?title=Integrated%20planning%20of%20electricity%20and%20natural%20gas%20transportation%20systems%20for%20enhancing%20the%20power%20grid%20resilience&author=C.%20Shao&author=M.%20Shahidehpour&author=X.%20Wang&author=X.%20Wang&author=B.%20Wang&journal=IEEE%20Trans%20Power%20Syst&volume=32&issue=6&pages=4418-4429&publication_year=2017&doi=10.1109%2FTPWRS.2017.2672728)

92. Zeng Q, Fang J, Chen Z, Li J, Zhang B. A multistage coordinative optimization for sitting and sizing P2G plants in an integrated electricity and natural gas system. 2016 I.E. Int Energy Conf. 2016:1–6. https://doi.org/10.1109/ENERGYCON.2016.7514061 (https://doi.org/10.1109/ENERGYCON.2016.7514061).

93. Zeng Q, Zhang B, Fang J, Chen Z. A bi-level programming for multistage co-expansion planning of the integrated gas and electricity system. Appl Energy. 2017;200:192–203. https://doi.org/10.1016/j.apenergy.2017.05.022 (https://doi.org/10.1016/j.apenergy.2017.05.022).
CrossRef (https://doi.org/10.1016/j.apenergy.2017.05.022)
Google Scholar (http://scholar.google.com/scholar_lookup?title=A%20bi-level%20programming%20for%20multistage%20co-expansion%20planning%20of%20the%20integrated%20gas%20and%20electricity%20system&author=Q.%20Zeng&author=B.%20Zhang&author=J.%20Fang&author=Z.%20Chen&journal=Appl%20Energy&volume=200&pages=192-203&publication_year=2017&doi=10.1016%2Fj.apenergy.2017.05.022)

94. Illinois Institute of Technology, White paper: long-term electric and natural gas infrastructure requirements. 2014. [Online]. Available: https://pubs.naruc.org (https://pubs.naruc.org)/.

95. Juris A. The emergence of markets in the natural gas industry. World Bank Policy Res Working Paper. 1998:1–37.
Google Scholar (https://scholar.google.com/scholar?q=Juris%20A.%20The%20emergence%20of%20markets%20in%20the%20natural%20gas%20industry.%20World%20Bank%20Policy%20Res%20Working%20Paper.%201998%3A1%E2%80%9337.)

96. Cui H, Li F, Hu Q, Bai L, Fang X. Day-ahead coordinated operation of utility-scale electricity and natural gas networks considering demand response based virtual power plants. Appl Energy. 2016;176:183–95. https://doi.org/10.1016/j.apenergy.2016.05.007 (https://doi.org/10.1016/j.apenergy.2016.05.007).
CrossRef (https://doi.org/10.1016/j.apenergy.2016.05.007)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Day-ahead%20coordinated%20operation%20of%20utility-scale%20electricity%20and%20natural%20gas%20networks%20considering%20demand%20response%20based%20virtual%20power%20plants&author=H.%20Cui&author=F.%20Li&author=Q.%20Hu&author=L.%20Bai&author=X.%20Fang&journal=Appl%20Energy&volume=176&pages=183-195&publication_year=2016&doi=10.1016%2Fj.apenergy.2016.05.007)

97. Dueñas P, Leung T, Gil M, Reneses J. Gas-electricity coordination in competitive markets under renewable energy uncertainty. IEEE Trans Power Syst. 2015;30(1):123–31. https://doi.org/10.1109/TPWRS.2014.2319588 (https://doi.org/10.1109/TPWRS.2014.2319588).
CrossRef (https://doi.org/10.1109/TPWRS.2014.2319588)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Gas-electricity%20coordination%20in%20competitive%20markets%20under%20renewable%20energy%20uncertainty&author=P.%20Due%C3%B1as&author=T.%20Leung&author=M.%20Gil&author=J.%20Reneses&

journal=IEEE%20Trans%20Power%20Syst&volume=30&issue=1&pages=123-131&publication_year=2015&doi=10.1109%2FTPWRS.2014.2319588)

98. Dueñas P, Barquín J, Reneses J. Strategic management of multi-year natural gas contracts in electricity markets. IEEE Trans Power Syst. 2012;27(2):771–9. https://doi.org/10.1109/TPWRS.2011.2175951 (https://doi.org/10.1109/TPWRS.2011.2175951).
CrossRef (https://doi.org/10.1109/TPWRS.2011.2175951)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Strategic%20management%20of%20multi-year%20natural%20gas%20contracts%20in%20electricity%20markets&author=P.%20Due%C3%B1as&author=J.%20Barqu%C3%ADn&author=J.%20Reneses&journal=IEEE%20Trans%20Power%20Syst&volume=27&issue=2&pages=771-779&publication_year=2012&doi=10.1109%2FTPWRS.2011.2175951)

99. Gil M, Duenas P, Reneses J. Electricity and natural gas interdependency: comparison of two methodologies for coupling large market models within the European regulatory framework. IEEE Trans Power Syst. 2016;31(1):361–9. https://doi.org/10.1109/TPWRS.2015.2395872 (https://doi.org/10.1109/TPWRS.2015.2395872).
CrossRef (https://doi.org/10.1109/TPWRS.2015.2395872)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Electricity%20and%20natural%20gas%20interdependency%3A%20comparison%20of%20two%20methodologies%20for%20coupling%20large%20market%20models%20within%20the%20European%20regulatory%20framework&author=M.%20Gil&author=P.%20Duenas&author=J.%20Reneses&journal=IEEE%20Trans%20Power%20Syst&volume=31&issue=1&pages=361-369&publication_year=2016&doi=10.1109%2FTPWRS.2015.2395872)

100. Spiecker S. Modeling market power by natural gas producers and its impact on the power system. IEEE Trans Power Syst. 2013;28(4):3737–46. https://doi.org/10.1109/TPWRS.2013.2262006 (https://doi.org/10.1109/TPWRS.2013.2262006).
CrossRef (https://doi.org/10.1109/TPWRS.2013.2262006)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Modeling%20market%20power%20by%20natural%20gas%20producers%20and%20its%20impact%20on%20the%20power%20system&author=S.%20Spiecker&journal=IEEE%20Trans%20Power%20Syst&volume=28&issue=4&pages=3737-3746&publication_year=2013&doi=10.1109%2FTPWRS.2013.2262006)

101. Wang C, Wei W, Wang J, Liu F, Mei S. Strategic offering and equilibrium in coupled gas and electricity markets. IEEE Trans Power Syst 2018;33(1):290–309. https://doi.org/10.1109/TPWRS.2017.2698454 (https://doi.org/10.1109/TPWRS.2017.2698454).

102. Morais M, Marangon Lima J. Combined natural gas and electricity network pricing. Electr Power Syst Res. 2007;77(5-6):712–9. https://doi.org/10.1016/j.epsr.2006.05.005 (https://doi.org/10.1016/j.epsr.2006.05.005).

CrossRef (https://doi.org/10.1016/j.epsr.2006.05.005)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Combined%20natural%20gas%20and%20electricity%20network%20pricing&author=M.%20Morais&author=J.%20Marangon%20Lima&journal=Electr%20Power%20Syst%20Res&volume=77&issue=5-6&pages=712-719&publication_year=2007&doi=10.1016%2Fj.epsr.2006.05.005)

103. • Geidl M, Andersson G. Operational and structural optimization of multi-carrier energy systems. Eur Trans Electr Power. 2006;16(5):463–77. **This is the most recent article which studies equilibrium of the interdependent electricity and natural gas system while bi-directional energy trading is allowed. The model studies optimal offering strategies and market powers of energy producers under the proposed market mechanism**. https://doi.org/10.1002/etep.112 (https://doi.org/10.1002/etep.112).
CrossRef (https://doi.org/10.1002/etep.112)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Operational%20and%20structural%20optimization%20of%20multi-carrier%20energy%20systems&author=M.%20Geidl&author=G.%20Andersson&journal=Eur%20Trans%20Electr%20Power&volume=16&issue=5&pages=463-477&publication_year=2006&doi=10.1002%2Fetep.112)

104. Geidl M, Andersson G. Optimal power flow of multiple energy carriers. IEEE Trans Power Syst. 2007;22(1):145–55. https://doi.org/10.1109/TPWRS.2006.888988 (https://doi.org/10.1109/TPWRS.2006.888988).
CrossRef (https://doi.org/10.1109/TPWRS.2006.888988)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Optimal%20power%20flow%20of%20multiple%20energy%20carriers&author=M.%20Geidl&author=G.%20Andersson&journal=IEEE%20Trans%20Power%20Syst&volume=22&issue=1&pages=145-155&publication_year=2007&doi=10.1109%2FTPWRS.2006.888988)

105. Kienzle F, Favre-Perrod P, Arnold M, Andersson G. Multi-energy delivery infrastructures for the future. 2008 First Int Conf Infrastruct Syst Serv Build Networks a Bright Futur. 2008:1–5. https://doi.org/10.1109/INFRA.2008.5439681 (https://doi.org/10.1109/INFRA.2008.5439681).

106. Favre-Perrod P, Kienzle F, Andersson G. Modeling and design of future multi-energy generation and transmission systems. Eur Trans Electr Power. 2010;20(8):994–1008. https://doi.org/10.1002/etep.379 (https://doi.org/10.1002/etep.379).
CrossRef (https://doi.org/10.1002/etep.379)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Modeling%20and%20design%20of%20future%20multi-energy%20generation%20and%20transmission%20systems&author=P.%20Favre-Perrod&author=F.%20Kienzle&author=G.%20Andersson&journal=Eur%20Trans%20Electr%20Power&volume=20&issue=8&pages=994-1008&publication_year=2010&doi=10.1002%2Fetep.379)

107. Geidl M, Andersson G. Operational and structural optimization of multi-carrier energy systems. Eur Trans Electr Power. 2006;16(5):463–77. https://doi.org

/10.1002/etep.112 (https://doi.org/10.1002/etep.112).
CrossRef (https://doi.org/10.1002/etep.112)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Operational%20and%20structural%20optimization%20of%20multi-carrier%20energy%20systems&author=M.%20Geidl&author=G.%20Andersson&journal=Eur%20Trans%20Electr%20Power&volume=16&issue=5&pages=463-477&publication_year=2006&doi=10.1002%2Fetep.112)

108. Moeini-Aghtaie M, Dehghanian P, Fotuhi-Firuzabad M, Abbaspour A. Multiagent genetic algorithm: an online probabilistic view on economic dispatch of energy hubs constrained by wind availability. IEEE Trans Sustain Energy. 2014;5(2):699–708. https://doi.org/10.1109/TSTE.2013.2271517 (https://doi.org/10.1109/TSTE.2013.2271517).
CrossRef (https://doi.org/10.1109/TSTE.2013.2271517)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Multiagent%20genetic%20algorithm%3A%20an%20online%20probabilistic%20view%20on%20economic%20dispatch%20of%20energy%20hubs%20constrained%20by%20wind%20availability&author=M.%20Moeini-Aghtaie&author=P.%20Dehghanian&author=M.%20Fotuhi-Firuzabad&author=A.%20Abbaspour&journal=IEEE%20Trans%20Sustain%20Energy&volume=5&issue=2&pages=699-708&publication_year=2014&doi=10.1109%2FTSTE.2013.2271517)

109. Zhang X, Shahidehpour M, Alabdulwahab A, Abusorrah A. Optimal expansion planning of energy hub with multiple energy infrastructures. IEEE Trans Smart Grid. 2015;6(5):2302–11. https://doi.org/10.1109/TSG.2015.2390640 (https://doi.org/10.1109/TSG.2015.2390640).
CrossRef (https://doi.org/10.1109/TSG.2015.2390640)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Optimal%20expansion%20planning%20of%20energy%20hub%20with%20multiple%20energy%20infrastructures&author=X.%20Zhang&author=M.%20Shahidehpour&author=A.%20Alabdulwahab&author=A.%20Abusorrah&journal=IEEE%20Trans%20Smart%20Grid&volume=6&issue=5&pages=2302-2311&publication_year=2015&doi=10.1109%2FTSG.2015.2390640)

110. Kienzle F, Ahcin P, Andersson G. Valuing investments in multi-energy conversion, storage, and demand-side management systems under uncertainty. IEEE Trans Sustain Energy. 2011;2(2):194–202. https://doi.org/10.1109/TSTE.2011.2106228 (https://doi.org/10.1109/TSTE.2011.2106228).
CrossRef (https://doi.org/10.1109/TSTE.2011.2106228)
Google Scholar (http://scholar.google.com/scholar_lookup?title=Valuing%20investments%20in%20multi-energy%20conversion%2C%20storage%2C%20and%20demand-side%20management%20systems%20under%20uncertainty&author=F.%20Kienzle&author=P.%20Ahcin&author=G.%20Andersson&journal=IEEE%20Trans%20Sustain%20Energy&volume=2&issue=2&pages=194-202&publication_year=2011&doi=10.1109%2FTSTE.2011.2106228)

111. Adamek F, Arnold M, Andersson G. On decisive storage parameters for minimizing energy supply costs in multicarrier energy systems. IEEE Trans

Sustain Energy. 2014;5(1):102–9. https://doi.org/10.1109/TSTE.2013.2267235 (https://doi.org/10.1109/TSTE.2013.2267235).
CrossRef (https://doi.org/10.1109/TSTE.2013.2267235)
Google Scholar (http://scholar.google.com/scholar_lookup?title=On%20decisive%20storage%20parameters%20for%20minimizing%20energy%20supply%20costs%20in%20multicarrier%20energy%20systems&author=F.%20Adamek&author=M.%20Arnold&author=G.%20Andersson&journal=IEEE%20Trans%20Sustain%20Energy&volume=5&issue=1&pages=102-109&publication_year=2014&doi=10.1109%2FTSTE.2013.2267235)

112. Najafi A, Falaghi H, Contreras J, Ramezani M. A stochastic bilevel model for the energy hub manager problem. IEEE Trans Smart Grid. 2017;8(5):2394–404. https://doi.org/10.1109/TSG.2016.2618845 (https://doi.org/10.1109/TSG.2016.2618845).
CrossRef (https://doi.org/10.1109/TSG.2016.2618845)
Google Scholar (http://scholar.google.com/scholar_lookup?title=A%20stochastic%20bilevel%20model%20for%20the%20energy%20hub%20manager%20problem&author=A.%20Najafi&author=H.%20Falaghi&author=J.%20Contreras&author=M.%20Ramezani&journal=IEEE%20Trans%20Smart%20Grid&volume=8&issue=5&pages=2394-2404&publication_year=2017&doi=10.1109%2FTSG.2016.2618845)

113. Rastegar M, Fotuhi-Firuzabad M, Zareipour H, Moeini-Aghtaie M. A probabilistic energy management scheme for renewable-based residential energy hubs. IEEE Trans Smart Grid. 2016;8:2217–27. https://doi.org/10.1109/TSG.2016.2518920 (https://doi.org/10.1109/TSG.2016.2518920).
CrossRef (https://doi.org/10.1109/TSG.2016.2518920)
Google Scholar (http://scholar.google.com/scholar_lookup?title=A%20probabilistic%20energy%20management%20scheme%20for%20renewable-based%20residential%20energy%20hubs&author=M.%20Rastegar&author=M.%20Fotuhi-Firuzabad&author=H.%20Zareipour&author=M.%20Moeini-Aghtaie&journal=IEEE%20Trans%20Smart%20Grid&volume=8&pages=2217-2227&publication_year=2016&doi=10.1109%2FTSG.2016.2518920)

114. Bahrami S, Toulabi M, Ranjbar S, Moeini-Aghtaie M, Ranjbar A. A decentralized energy management framework for energy hubs in dynamic pricing markets. IEEE Trans Smart Grid. 2017:1. https://doi.org/10.1109/TSG.2017.2723023 (https://doi.org/10.1109/TSG.2017.2723023). (to appear)

115. Saldarriaga C, Hincapie R, Salazar H. An integrated expansion planning model of electric and natural gas distribution systems considering demand uncertainty. IEEE Power Energy Soc Gen Meet. 2015;2015:1–5. https://doi.org/10.1109/PESGM.2015.7286580 (https://doi.org/10.1109/PESGM.2015.7286580).
Google Scholar (http://scholar.google.com/scholar_lookup?title=An%20integrated%20expansion%20planning%20model%20of%20electric%20and%20natural%20gas%20distribution%20systems%20considering%20demand%20uncertainty&author=C.%20Saldarriaga&author=R.%20Hincapie&author=H.%20Salazar&journal=IEEE%20Power%20Energy%20Soc%20Gen%20Meet&volume=2015&pages=1-5&publication_year=2015&doi=10.1109%2FPESGM.2015.7286580)

116. Saldarriaga C, Hincapié R, Salazar H. A holistic approach for planning natural gas and electricity distribution networks. IEEE Trans Power Syst. 2013;28(4):4052–63. https://doi.org/10.1109/TPWRS.2013.2268859 (https://doi.org/10.1109/TPWRS.2013.2268859).
CrossRef (https://doi.org/10.1109/TPWRS.2013.2268859)
Google Scholar (http://scholar.google.com/scholar_lookup?title=A%20holistic%20approach%20for%20planning%20natural%20gas%20and%20electricity%20distribution%20networks&author=C.%20Saldarriaga&author=R.%20Hincapi%C3%A9&author=H.%20Salazar&journal=IEEE%20Trans%20Power%20Syst&volume=28&issue=4&pages=4052-4063&publication_year=2013&doi=10.1109%2FTPWRS.2013.2268859)

117. Odetayo B, MacCormack J, Rosehart W, Zareipour H. A chance constrained programming approach to integrated planning of distributed power generation and natural gas network. Electr Power Syst Res. 2017;151:197–207. https://doi.org/10.1016/j.epsr.2017.05.036 (https://doi.org/10.1016/j.epsr.2017.05.036).
CrossRef (https://doi.org/10.1016/j.epsr.2017.05.036)
Google Scholar (http://scholar.google.com/scholar_lookup?title=A%20chance%20constrained%20programming%20approach%20to%20integrated%20planning%20of%20distributed%20power%20generation%20and%20natural%20gas%20network&author=B.%20Odetayo&author=J.%20MacCormack&author=W.%20Rosehart&author=H.%20Zareipour&journal=Electr%20Power%20Syst%20Res&volume=151&pages=197-207&publication_year=2017&doi=10.1016%2Fj.epsr.2017.05.036)

Copyright information

About this article

Cite this article as:
He, C., Zhang, X., Liu, T. et al. Curr Sustainable Renewable Energy Rep (2018) 5: 23. https://doi.org/10.1007/s40518-018-0093-9

- First Online 13 February 2018
- DOI https://doi.org/10.1007/s40518-018-0093-9
- Publisher Name Springer International Publishing
- Online ISSN 2196-3010

- About this journal
- Reprints and Permissions

Personalised recommendations