

APPENDIX B: Ken Nichols Resume

Ken Nichols, Principal, EQL Energy LLC

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Mr. Nichols' practice areas at EQL are smart grid business planning and operations, demand response and energy efficiency program design and evaluation, renewable development, utility resource and transmission planning, and wholesale market operations, and supporting policy. His clients include utilities, vendors and utility service providers, as well as large energy consumers.



- Bonneville Power Administration. DSM emerging technology research, program design/tools, custom projects – residential and non-residential lighting and controls. (2016-17).
- Utility and research grant proposal development related to solar, storage, and IDSM pilots. (ongoing)
- Western Interstate Energy Board. "Distributed Energy Resources and changes in Distribution planning and operations." (<https://westernenergyboard.org/>) (2015)
- BC Hydro – Capacity DSM planning and RFP development.
- University of British Columbia, Electric Load Management study (T&D infrastructure deferral), (2014- 2016)
- IDSM (demand response and EE) program planning, utility resource and transmission planning, and DSM evaluation and planning (ongoing)
- Innovari Inc., Hillsboro, OR. Product Marketing, BMS controls, utility dispatchable backup generation, inverter utility integration. (2014-2015)
- Industrial Energy Efficiency firm, Strategic and business planning, networked projects (2013)
- VP, Energy Management at PureSense Environmental Inc., Fresno, CA. (2011-2013). Managed vendor based agricultural demand response program that achieved 26MW of AutoDR and over \$60MM in products and service sales.
- Refrigeration controls company, AutoDR development, DR pilot, and marketing
- Energy Storage startup – Utility demonstration, Arpa-E grant, commercialization, market assessments (2012)
- Assistant Professor, Portland State University "Smart Grid for Sustainable Communities." (2010-12)

Ecofys US, LLC*Director, US Risk Management**Director, Power Systems and Markets*

Portland, OR

2010-2011

Managed AutoDR pilot at BPA and 9 PNW utilities. Evaluating capabilities of technologies, e.g., commercial thermostats, industrial refrigeration, and water heater controls, to provide both increase and decrease of loads with 10-minute notice. Work involved technology assessment, contract negotiation, customer and utility engagement, business case development, and financial analysis.

PG&E / TransCanada*Director, US Risk Management*

Portland, OR

2002 - 2010

Responsible for risk management of \$1.6 Billion in annual US operating revenues in power and gas transmission. Managing policies, FERC tariff and rate cases related to financial risk management, integrated CFO operations at 4 separate US offices, designed and implemented new IT systems, part of rate case team, and managed the recovery of over \$400 Million in defaulted obligations. Other group duties include evaluate risk on new projects, credit/financial risk analysis, project valuation/negotiation, financial reporting, FERC tariff and policy setting, and relationships with lenders and rating agencies.

Hafslund Energy Trading*General Manager*

Seattle, WA

1997 - 2001

Startup and management of Hafslund Energy Trading (HET) a power/gas trading and marketing firm in the WECC from 1997-2002. HET had 15 employees at its peak and was profitable a year after startup. Markets traded included OTC power throughout WECC, CA ISO and PX, and natural gas futures. Responsibilities included: Risk Management, HR, Representative on CAISO groups, power modeling and IT development.

Barakat & Chamberlin*Consultant*

Boulder, CO

1992-1997

Barakat & Chamberlin was a leading DSM and Utility consulting firm sold to PG&E in 1998. Mr. Nichols worked on projects in areas such as: integrated resource planning, energy efficiency, rate case studies, demand side management program design and evaluation, renewable energy assessment, and load/price forecasting. Clients include PSCO (nka Xcel Energy), Midwest Power, PG&E, PacifiCorp, Nevada Power, Tacoma PUD, TVA, and Denver Water Dept.

National Renewable Energy Lab
Economist

Golden, CO
1992

Market penetration and resource studies for Solar PV, and Biomass. (11 months)

Education

Portland State University
Assistant Professor

Portland, OR
2011-2013

Stanford University
M.S., Management Science and Engineering
Energy Modeling Forum, contributor

Stanford, CA
June 1992

Willamette University
B.A., Physics & Computer Science

Salem, OR
June 1986

Universite Aix-Marseilles

Aix-en-Provence FRANCE
1985

Groups

- AESP (Association of Energy Service Professionals <http://www.aesp.org/>)
- WIEB – Technical Advisory, Interconnection and Reliability working group
- SmartGrid Northwest (www.smartgridnw.org)
- DisCo (Distribution System Collaborative, Washington State)
- PLMA (Peak Load Management Alliance)
- Northwest Energy Coalition (Northwest Policy Stakeholder)
- Northwest Intermountain Independent Power Producer Coalition (NIPPC)
- Renewable Northwest (www.renewablenw.org)
- OpenADR standards committee (www.openadr.org)
- LNBL/DRRC – Demand Response Research Center
- ACEEE (American Council for an Energy Efficient Economy)
- NWGA (Northwest Gas Association (www.nwga.org) at PG&E
- WPTF (Western Power Trading Forum, www.wptf.org) while at HET
- WSPP (Western Systems Power Pool, <http://www.wspp.org/>), HET

Research and Presentations

1. 2017 NIPPC annual conference. DER opportunity and risks on the distribution system. (Northwest and Intermountain Power Producers Coalition).
2. 2017 PNWER Carbon Pricing in the Pacific Northwest moderator
3. 2016 Washington State legislative work session, DER value: jobs and rate reduction
4. 2015 Distribution System Collaborative, State of Washington, Dec. 1, 2015.
5. 2015 PNWER Summit, Big Sky MT, Distributed Energy Resources in the Pacific Northwest.
6. 2015 Western Interstate Energy Board, paper on Distribution Issues of expanding Distributed Energy Resources. <http://westernenergyboard.org/2015/05/final-report-released-by-eql/>
7. Western Energy Institute March 2015: Panel on Energy Storage
8. Transactive Energy in US Power Markets, PLMA Conference October 2013.
9. AutoDR irrigation controls. Southern California Edison Water Conference, October 2012.
10. AutoDR refrigeration controls vendor analysis, 2012. Confidential.
11. Peak Load Management Association, May 2012, New York, NY, "End Use Energy Storage and Renewable Integration."
12. BPA, *TI-220 Smart End-Use Energy Storage and Integration of Renewable Energy*, Sep 2012. http://www.bpa.gov/EE/Technology/demand-response/Documents/TI_220_Project_Ecofys_Evaluation_Report.pdf
13. Bonneville Environmental Foundation, "End-Use Energy Storage and Demand Response at BPA: What are the gaps to Demand Response in BPA's service territory?," October 2011. Confidential.
14. *Smart Grid Oregon policy paper, Rethinking Regulation; Mismatches between Smart Grid and traditional regulation*. 2010
<http://www.smartgridoregon.org/Resources/Documents/Rethinking%20Regulation%20V6A%20011611.pdf>
15. "Review of PGE's Feeders Advanced Storage Transaction system", A utility scale battery and high reliability zone smart grid pilot project. 2010
16. "Tools of the Trade" article on price/volume risk management for Energy Power and Risk Management Journal, June 2002.
17. Energy Exchanges Online conference. September 10-11 New Orleans LA, Seminar on clearing and credit risk mitigation.
18. FIA (Futures Industry Association) conference Boca Raton March 2001. Panel on New Clearing Models. (other panel members include CME, BOTCC, CapClear, OnExchange, and eMetra)
19. Energy Exchanges Online conference. December 6-7 2000 Scottsdale AZ, Panel on Credit issues in energy trading marketplace

20. "ISO development: The Cost of Cost and Complexity" EUS conference, March 1999, ISO Development and Transmission Pricing.
21. "Trading in California's ISO and PX markets," November 1998. Presented at Electric Utility Consultant conference "ISOs and related transmission pricing." Also used in FERC intervention ER-98-211.
22. "Using Option Theory in Pricing Spark Spreads," EUS Conference on Converging Deregulation in Natural Gas and Power Markets. (1996)
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23. "Valuing Flexible Resources in an Uncertain Future," Option Pricing in Planning and Contracting. 1994 American Council for an Energy Efficient Economy (ACEEE), and 1994 17th Annual International Association for Energy Economics.
24. "Moving from DSM to Value-Added Customer Services: A Guidebook for the Journey," ADSMP Topic paper, 1994.
25. "Incorporating Risk into IRP," Electricity Journal, June 1993.
26. "Reducing the Capital Costs of Utility Scale Wind Energy," NREL, 1992.
27. Market Penetration study for Solar Photovoltaics, NREL white paper, 1992.
28. "Profit on Conservation: A Critical Look at PG&E's Shared Savings," PG&E white paper, 1991.

Other notes:

In 2015 EQL Energy was hired by CENSE to evaluate the need and alternatives of Puget Sound

Energy's (PSE) Energize Eastside project. We found many flaws in PSE's load forecasts, modeling assumptions, modeling, and Non-Wire Alternatives (NWA) screening study. We were surprised that PSE 1) would not provide CENSE or other stakeholders with historical load and load type information on the Eastside substations and circuits, and 2) did not perform an open RFP for NWA solutions. Because of the opaque process, we could not perform a complete needs and alternative analysis, but based on available information, it appears clear that PSE has sufficient non-wire alternatives at their disposal to completely avoid building the Energize Eastside transmission line. Moreover, in October 2015 EQL also submitted a formal economic study request to PSE Transmission's group pursuant to Attachment K of PSE's FERC OATT (Open Access Transmission Tariff) requesting that PSE evaluate a portfolio of non-wire solutions.¹ This study was never conducted.

PSE has historically only analyzed and screened for EE/DR cost effectiveness on a system basis and does not consider specific locational values of these programs.

1. PSE compares EE/DR to supply side costs, e.g., natural gas plants, market purchases, etc. They do not consider use of EE/DR to address any specific T&D cost avoidance.
2. This separate planning method is changing across the US, especially in places with open markets, e.g., CA, TX, NY, and New England. References to be provided. PSE will likely join the rest of the country as the WUTC rulemaking process UE-161024 provides clear rules and processes for improved planning and procurement processes. EQL will reference our testimony and others in U-161024.
3. This is changing for most utilities in US, examples include all open market areas, and CA, NY, New England, etc. Specific examples of projects targeting T&D include:
 - CA: PG&E, SCE, and SDG&E
 - PNW: PGE doing DER testbeds for 3 substations,
 - NY: ConEd, Rochester

¹ http://www.oatioasis.com/PSEI/PSEIdocs/Oct_31_PSET_Economic_Study_Request_from_EQL.PDF