

PacifiCorp - Stakeholder Feedback Form

2015 Integrated Resource Plan

PacifiCorp (the Company) requests that stakeholders provide feedback to the Company upon the conclusion of each public input meeting and/or stakeholder conference calls, as scheduled. PacifiCorp values the input of its active and engaged stakeholder group, and stakeholder feedback is critical to the IRP public input process. PacifiCorp requests that stakeholders provide comments using this form, which will allow the Company to more easily review and summarize comments by topic and to readily identify specific recommendations, if any, being provided. Information collected will be used to better inform issues included in the 2015 IRP, including, but not limited to the process, assumptions, and analysis. In providing your feedback, PacifiCorp requests that the stakeholders identify whether they are okay with the Company posting their comments on the IRP website.

Yes No May we post these comments to the IRP webpage? Date of Submittal 9/16/2014
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Public Meeting Date comments address: [Click here to enter date.](#) Check here if not related to specific meeting

List additional organization attendees at cited meeting:

Additional individuals who participating in preparing comments: Jim Jensen (WSU Energy Program), Craig Frear (WSU Biological Systems Engineering), Mary Harrington (WA Dept of Ecology), Mary Beth Lang (WA Dept of Agriculture), Mark Fuchs (Wa Dept of Ecology)

***IRP Topic(s) and/or Agenda Items:** List the specific topics that are being addressed in your comments.
Anaerobic Digesters Resource Assessment

Check here if any of the following information being submitted is copyrighted or confidential.

***Respondent Comment:** Please provide your feedback for each IRP topic listed above.

- Manure volumes referenced in assessment appear to reflect average herd size of 60 selected dairies, but the actual assumed herd size (number of head) is not shown in the production estimates.
- The report uses information about the dairy industry from the 2011 WSDA report, summarizing 2010 registration data. Since then, dairies, on average, have gotten larger. Registration data for 2012 shows the total number of dairies decreased by 28 (from 443 to 415). By size, small- and medium-sized dairies declined by 18 and 13 respectively; the number of large dairies increased by 3. USDA reports that Washington's total annual milk production increased 7% between 2010 and 2013. This may not be worth more than a footnote as, for the actual analysis, Harris Group used data from the 2012 registration that they requested from WSDA in spring of 2014.
- There is no sensitivity analysis demonstrating improved economics of scale for larger operations, many of which are in PacifiCorp's service territory.
- Assumes digesters are associated with individual farms, there is no discussion of opportunities to develop digesters serving a number of nearby or adjacent farms. Of the eight commercial dairy digesters in Washington, four digest manure from more than one dairy operation.
- There are occasional references to the benefits of co-digestion with additional substrates, and resulting improvements in biogas generation, but the model assumes low-cost substrates would only come from

* Required fields

distant urban centers and that rural substrates are already committed to animal feed. Therefore, the model only uses manure and precludes substrates that may be readily available from food processing operations and other sources in relatively close proximity.

- The assessment points out the difficulty of realizing any economic return on a manure-only CHP model, but many creative approaches to other value-added revenue streams exist which can often make a digester more economically viable.
- The Climate Trust data regarding GHG emissions only applies to carbon credits, which capture only a fraction of total avoided methane emissions. Missing are CO₂ reductions from fuel displacement and NO_x reductions from application of nutrients to agricultural lands.
- OPEX assumptions of 9 cents/kWh are too high. Multi-year data from a complex digester operation in Idaho shows OPEX of 6.9 cents/kWh. A recent WSU study of actual O&M costs for traditional digesters in Washington State found OPEX of 4 cents/kWh.
- The assessment mislabels costs cited in an NRCS report concerning the cost of producing electricity. The data included both annualized CAPEX and OPEX. The business plan prepared by WSU for the DeRuyter digester in PacifiCorp service territory found the baseline cost of electrical production to be 3.3 cents/kWh. A study by the Washington State Housing Finance Commission projected a cost of 2.8 cents/kWh.
- The assessment projects CAPEX of \$3,000-3,500 per installed kW. This figure is probably closer to \$4,000-5,000, or \$1,370 per cow, since gen-sets, interconnection equipment, buildings, fiber separation and collection equipment, substrate pits, and gas conditioning equipment are all essential components of digester operation. In addition, digester gen-sets are often oversized due to expectations about future feedstocks and increased herd size.
- The assessment fails to recognize the value of digesters as sources of baseload power.
- A 60% manure collection rate is assumed since most farms are open lots, but there are also tie-stall barn operations with collection rates closer to 90%.
- Assumes 90% average run time for gen-sets, though a recent study of all 12 Andgar digesters (including nearly all digesters in Washington State) found 94-95% average run time.
- The assessment fails to distinguish between regular plug-flow and mixed plug-flow digesters.
- The biogas composition lists nitrogen as N₂. It may be more appropriate to reflect nitrogen as ammonia gas.

Data Support: If applicable, provide any documents, hyper-links, etc. in support of comments. (i.e. gas forecast is too high - this forecast from EIA is more appropriate). If electronic attachments are provided with your comments, please list those attachment names here.

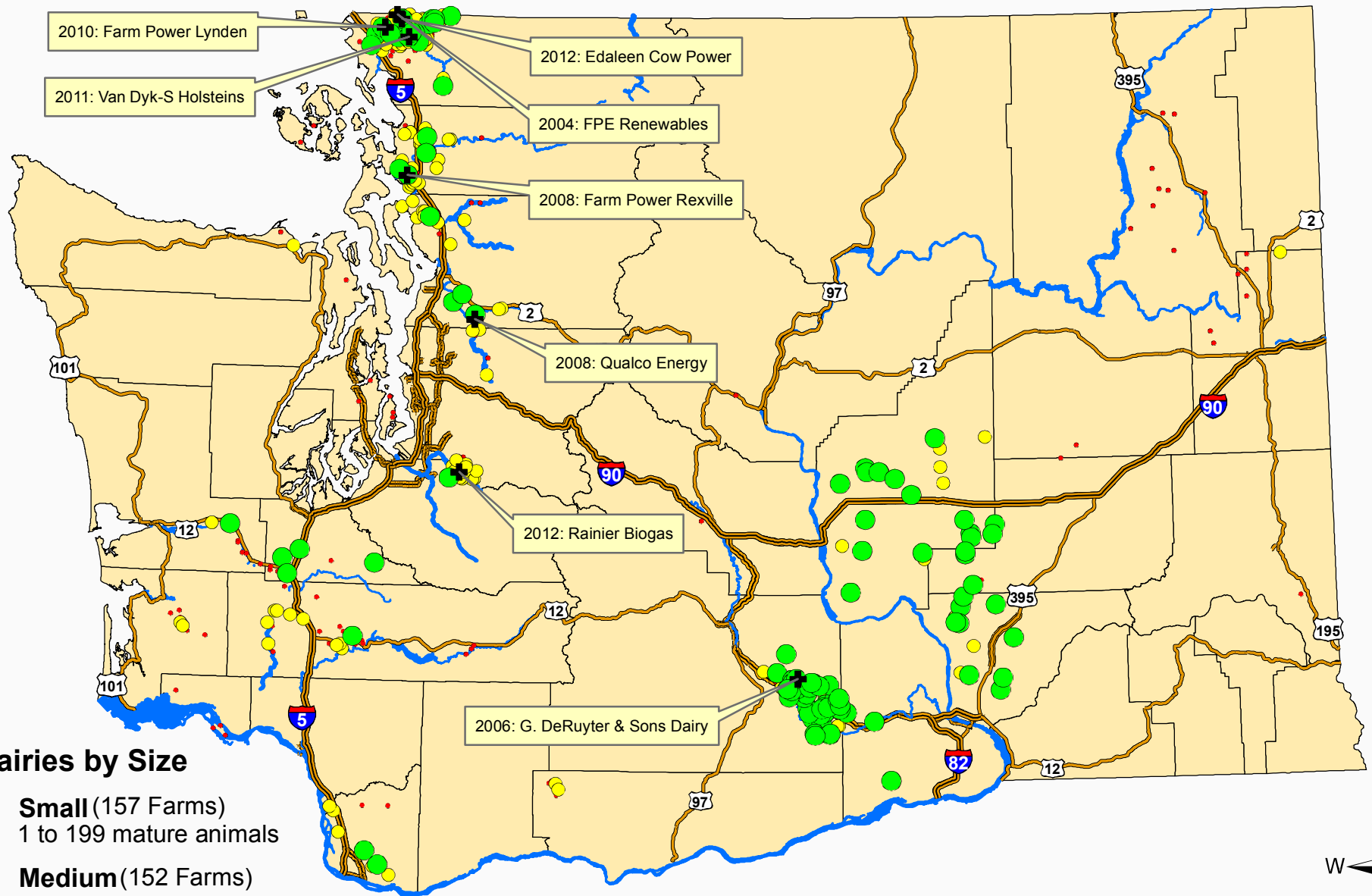
[Click here to enter text.](#)

Recommendations: Provide any additional recommendations if not included above - specificity is greatly appreciated.

[Click here to enter text.](#)

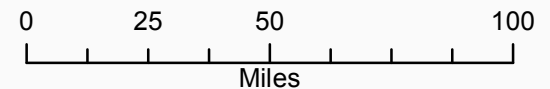
Thank you for participating.

Washington Cow Dairies and Digesters, April 2014



Dairies by Size

- **Small** (157 Farms)
1 to 199 mature animals
- **Medium** (152 Farms)
200 to 699 mature animals
- **Large** (106 Farms)
700 or more mature animals
- ✚ **Dairy Digesters**
(Year Operational: Name)



Source: WSDA Dairy Nutrient Management Program, 2012 Registration