Geothermal Update

By Lorraine Manz

Local News

In spite of record-breaking spring and summer floods forcing some contractors to postpone or temporarily abandon operations, 2011 turned out to be another very good year for the state geothermal program. There are now 1,135 geothermal installations in North Dakota – a 26% increase over the cumulative year-end total of 897 for 2010 (fig. 1).

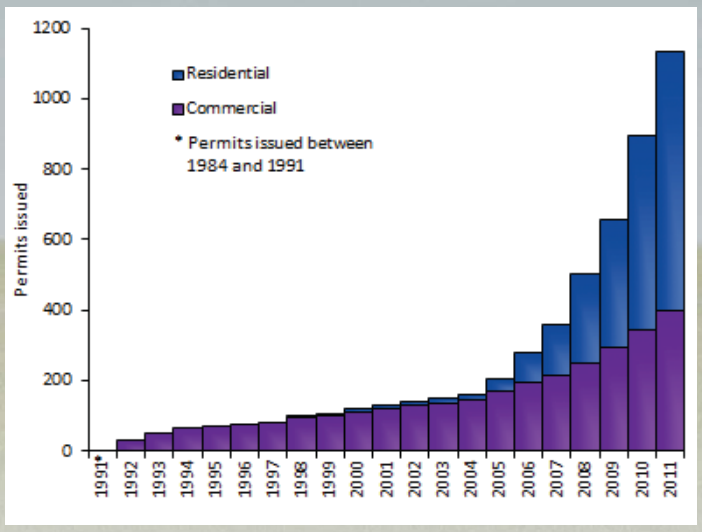

Figure 1. Annual cumulative totals of geothermal installations in North Dakota.

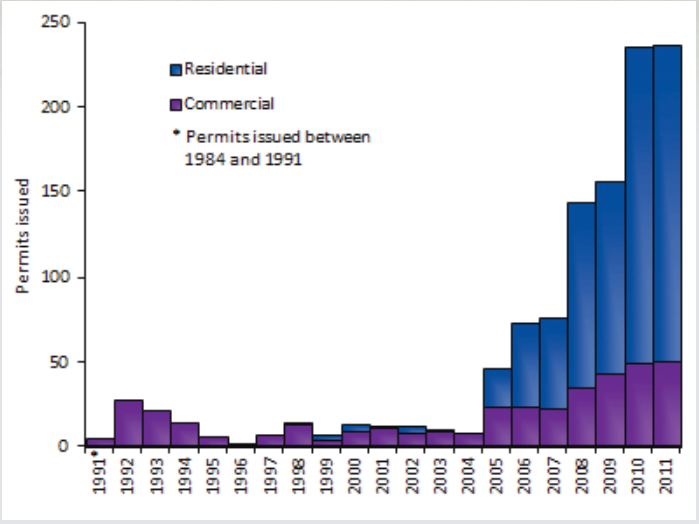

Figure 2. The NDGS issued 237 geothermal energy extraction permits in 2011: 51 commercial and 186 residential, bringing the total number of permitted installations in North Dakota to 1,135. The 2010 permit total was 236 (50 commercial and 186 residential).

The number of permits approved by the NDGS in 2011 was 237, which is just one more than last year (fig. 2). How much of this apparent leveling off may be blamed on flooding is open to conjecture, but the devastating inundation of urban areas like Minot and the riverside developments in and around Bismarck and Mandan where geothermal systems are most common, must surely have had some effect. There may be other reasons as well: the demand for geothermal is starting to outpace supply, particularly among homeowners, to the point that the amount of work is more than local contractors can handle; the difficulty some geothermal drilling companies are having is with finding and keeping good help because they cannot match the big salaries to be had in North Dakota's booming oil patch; the current price of natural gas at about $6/decatherm is a significant cost disincentive, especially for anyone considering a retrofit. Regardless of the possible cause(s), the overall shape of the graph in figure 2 suggests it would be wrong to presume that 2011 marks the beginning of a new trend. We will know better in a year or two.

The overall distribution of geothermal installations across the state remains much the same (fig. 3) with Bismarck continuing to dominate the map followed (at some distance) by Mandan and Fargo. The explanation for Bismarck's overwhelming lead (and also the disproportionately high count for Mandan) appears to be the enormous popularity of geothermal with the area's homeowners. Of the 279 installations in Bismarck, 241 (86%) are residential, as are 59 (87%) of those in Mandan. By comparison, only 20 (32%) of Fargo's 63 geothermal installations are in someone's house.

Statewide, 735 (65%) of North Dakota's geothermal installations are residential, with an average capacity of about 5 tons (60,000 Btu/h, ~20 kW). In the first twelve months of use, the little 3-ton system at my home cut our annual household energy consumption by 44% or roughly 17,000 kWh. On the broad assumption that the other 734 households are saving a similar amount, this equates to a minimum annual energy reduction of around 12.5 MWh. Assuming, further, that all this energy is in the form of electricity; based on the average monthly residential use of 1,121 kWh/month for North Dakota (U.S. EIA, 2011a), 12.5 MWh is more than enough electricity to power every household in either Burke or Logan County or in a city the size of Carrington for one year. Regrettably, insufficient data prevents the inclusion of commercial energy savings in these calculations but if it were possible, these numbers would be much, much larger.

No Data

In the January 2011 issue of *Geo News* (Manz, 2011) I wrote about North Dakota's standing as one of the top states in the nation for the number of geothermal heat pumps per capita. My numbers were based on data published by the U.S. Energy Information Administration (EIA) in its Geothermal Heat Pump Manufacturing Activites series of annual reports. The report for 2010 was scheduled for release on November 1 but a 14% cut in Congressional funding earlier this year compelled the EIA to axe a

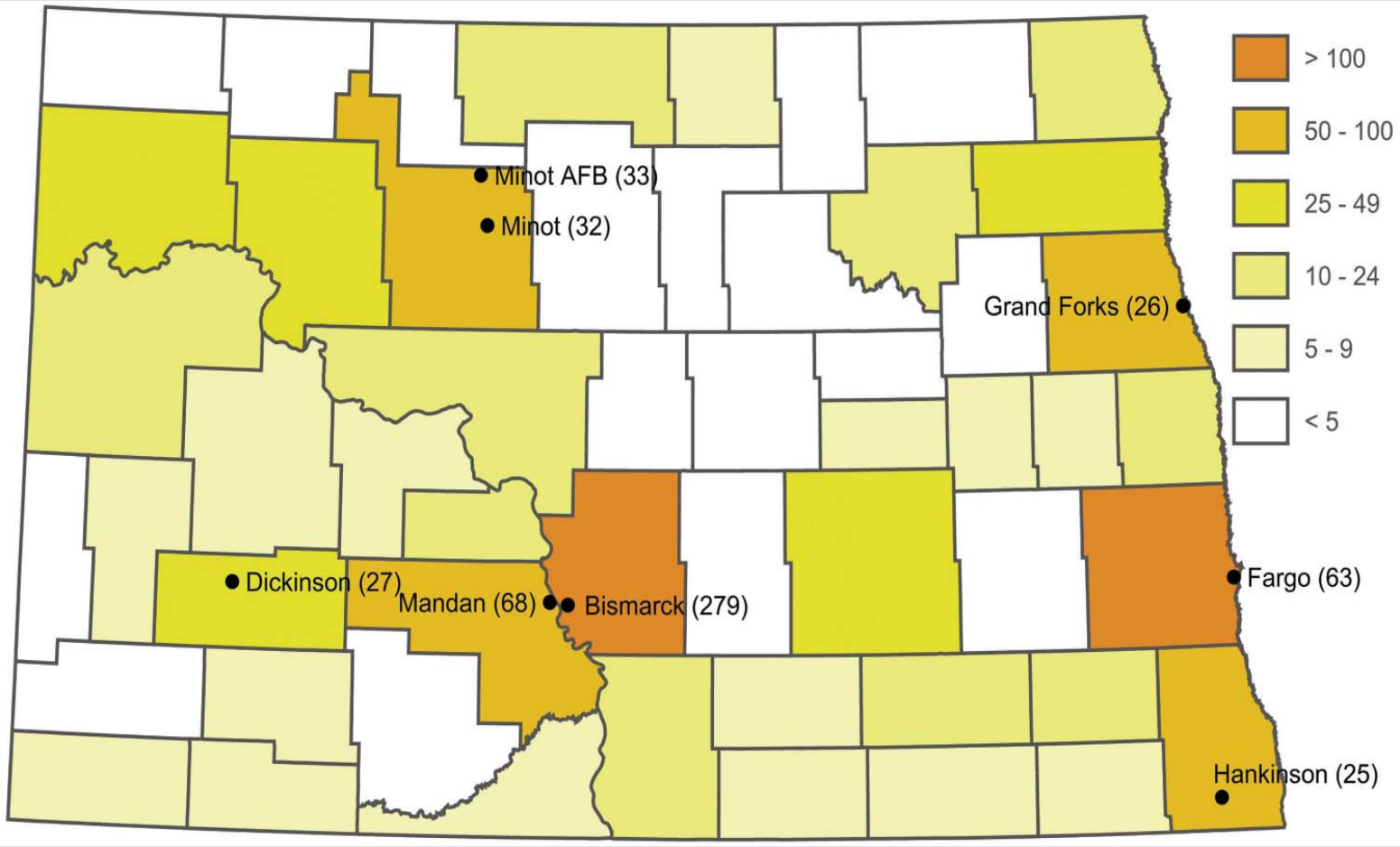

Figure 3. Distribution of geothermal systems by county. Communities with 25 or more are also identified with the actual number of installations shown in parentheses. The figure for Minot Air Force Base includes 16 off-base installations.

number of its programs and sadly, the annual data collection and report on geothermal heat pump systems was one of them (U.S. EIA, 2011b). Although there is a good chance that at least some of this funding may be restored under the 2012 Energy and Water Appropriations bill, no appropriation has been made as yet. In the meantime the EIA is operating under a continuing resolution that precludes any decision on the future of its programs and services.

A National Standard

An improperly installed geothermal system not only disappoints its hapless owner, it damages the reputation of an entire technology. To remediate the problem, the Geothermal Exchange Organization (GEO), a non-profit trade association and strong advocate of the geothermal industry, has undertaken the task of creating a national geothermal standard (U.S. Department of Energy, 2011). Funded by a grant from the U.S. Department of Energy, the Geothermal Heat Pump National Certification Standard (GHPNCS) Project's aim is to develop a standard that encompasses every aspect of the design and installation of geothermal systems. GEO is partnered in this project by the International Ground Source Heat Pump Association (IGSHPA) and Oak Ridge National Laboratory (ORNL).

References

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