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A Solid Wood **Bioheat Guide** for Rural and Remote Communities in Ontario

What is the guide and why is it needed?

With increasing heating costs and climate change becoming top of mind, communities are taking a more serious look at energy alternatives. One of the top choices for energy alternatives is bioheat from modern wood heating technology. Bioheat systems are reliable, efficient and can supplement or replace current fossil fuel and/or electric heating systems with local, sustainably sourced, and renewable solid woody biofuels.

A guide has thus been developed to provide people in Ontario's rural and remote communities with the information and confidence they need to use wood from Ontario's sustainably managed forests to produce space heat and domestic hot water. It is aimed at community leaders such as those found in municipal governments, band councils, school boards, churches, not-for-profit organizations, and small businesses, as well as private homeowners. While it is tailored to Ontario regulations and resources, much of the guide is technical and applicable elsewhere.

What are biomass, biofuel, and bioheat?

Biomass includes all biological matter and can originate from forestry, arboricultural, agricultural, horticultural, or aquacultural operations. When biomass is processed into a fuel used to produce heat or power, it is called biofuel. Bioheat is the heat produced when biofuel is combusted.

The guide discusses only solid woody biofuel produced from forest resources. It refers to four categories of solid woody biofuel which are cordwood (firewood) (Figure 1), wood chips (Figure 2), wood briquettes (Figure 3), and wood pellets (Figure 4).

Figure 1. Stacked and covered cordwood.

Figure 2. A high-quality wood chip (left) and a lower quality wood chip (right).

Ontario has a large supply of woody biomass sourced from sustainably managed forests (mill and harvest residues and unmerchantable standing timber) that could be used to produce solid woody biofuel.

Figure 3. Various types of wood briquettes. (Photo: CanmetENERGY, Natural Resources Canada)

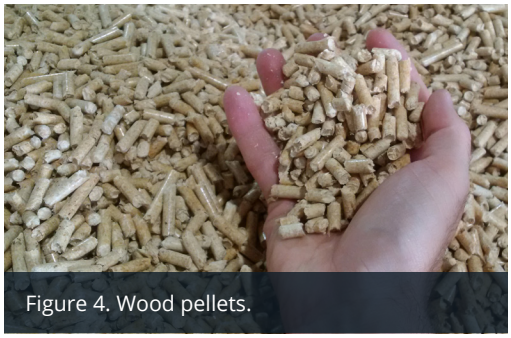

Figure 4. Wood pellets.

What are modern bioheat combustion systems?

Modern bioheat systems are well-developed and highly engineered mechanical systems with sophisticated controls. They are ideal for providing space heat and domestic hot water for community buildings and businesses, as well as for

private homes. The technology is widely used in Europe, Alaska, and the northeastern United States, as well as across Canada. Bioheat systems are relatively new to Ontario, which is why this guide has been developed.

The guide is applicable to systems that are factory-built and less than 1 MW in size that use solid woody biofuels to produce heat.

The three types of combustion systems included in this guide are stoves (Figure 5), furnaces (Figure 6), and boilers (Figure 7). The major considerations for sourcing and using each type of biofuel for institutional/ commercial and residential applications are outlined in the guide. The guide addresses the planning steps and funding options for bioheat systems.

Figure 5. Residential wood pellet stove.

Figure 6. Wood pellet furnace.

Figure 7. Wood chip boiler.

What are the benefits of switching to bioheat?

- Low and stable energy costs
- Biofuels are renewable and low-carbon
- Lower environmental risk than fossil fuels
- Reliable fuel supply
- Bioheat systems are reliable and easy to operate
- Support for local jobs and economic development
- Stimulation of community development
- Funding for local forest stewardship activities

What is included in the guide?

- Section 1: Introduction
- Section 2: Benefits of choosing bioheat
- Section 3: Solid woody biofuels
- Section 4: Bioheat combustion systems
- Section 5: Important factors to consider when choosing bioheat
- Section 6: New-build bioheat installations compared to retrofit installations
- Section 7: Residential bioheat projects
- Section 8: Institutional and commercial bioheat projects
- Section 9: Other bioheat systems

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