



Sustainably Reliable

1325 Fourth Avenue, Suite 1440, Seattle, WA 98101  
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## SEATTLE STEAM COMPANY FREQUENTLY ASKED QUESTIONS

### **What products/services does Seattle Steam provide?**

The company provides thermal energy (heat) produced at two central heating plants in downtown Seattle. The energy is distributed by pressurized steam, which is piped under Seattle's streets to nearly 200 buildings in downtown and on First Hill. In addition to heating those buildings, there are a myriad of other uses. Hospitals use high temperature steam for onsite purposes, such as sterilization of medical instruments. The steam is also used for humidity control at institutions, like the Seattle Art Museum, where valuable art installations have precise humidity and temperature requirements.

A small amount of steam condensate remains after the heat is delivered to customers' buildings. It is re-used by many customers to reduce their buildings' overall water usage and utility costs. Condensate is as clean as distilled water and can be used for a number of purposes, including landscaping, laundry, dishwashing, and it can also be used to displace make-up water in a building's cooling tower. Seattle Steam works closely with customers to help them recycle condensate.

### **What is District Energy?**

District Energy is a system that delivers energy from a centralized location to multiple customers within a defined service area. Seattle Steam is a District Energy system that produces steam at two central plants and then distributes that energy to buildings in the city for space heating and domestic hot water heating. District energy systems are in widespread use throughout the world because a large number of buildings and institutions can be served with a relatively small footprint. Seattle Steam is one of the most efficient steam heating systems in North America. In the fall of 2009, Seattle Steam made the commitment to begin using renewable sources of energy (clean urban waste wood) to provide thermal energy to its customers.

### **How reliable is Seattle Steam?**

Seattle Steam is one of the nation's most reliable energy providers. During the Nisqually earthquake in 2001, Seattle Steam remained in service with no downtime. It is a nearly 100% reliable energy source. Seattle Steam has state-of-the-art controls that continuously monitor its output. The company has redundancies built into the system that allow additional boilers to produce energy when needed and its team is available 24 hours a day and ready to make emergency repairs as needed.



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### **What are the benefits of using Seattle Steam?**

Seattle Steam is a very reliable source of energy. The company has not experienced a major outage that affected a customer in more than five years. Before that, it had been 25 years since there was an outage. There are other economic, environmental and technical advantages. Using Seattle Steam eliminates the capital costs associated with buying individual boilers in buildings (which also takes up valuable space). Many of the operating and maintenance staff costs are greatly reduced by eliminating the need for highly trained on-site maintenance and operating personnel and annual maintenance contracts.

Seattle Steam is one of the nation's most efficient systems because it captures and reuses any waste heat and energy before it leaves the plant. In the fall of 2009, Seattle Steam began its conversion to renewable energy by installing a boiler that can burn clean urban waste wood. The biomass boiler has the capability of cutting the fossil fuel-based carbon footprint of Seattle Steam and its customers by 50 percent — advancing the City's green initiatives and goal of complying with the Kyoto accord.

### **How efficient is Seattle Steam energy?**

Seattle Steam operates an efficient steam district heating system. It achieves its efficiency by re-capturing waste heat from the boiler exhaust gases before they leave the plant. ENERGY STAR's (ENERGY STAR is a joint program of the U.S. Environmental Protection Agency and the U.S. Department of Energy helping to save money and protect the environment through energy efficient products and practices) Energy Portfolio Manager Program rates steam district heating as one of the most efficient forms of heat for a property when making source to site comparisons. Typically, a Seattle Steam-heated building will obtain a higher ENERGY STAR score than a similar building using either electricity or gas for heat.

### **How does Seattle Steam help customers manage their building efficiency?**

Seattle Steam actively helps its customers make their buildings more energy efficient. The company partners with building owners and operators to reduce usage and is a strong supporter of the Energy Star building efficiency rating system. Seattle Steam's ENERGY STAR-certified professional engineers provide energy audits and even input data into the Energy Star portfolio manager on behalf of its customers. The company uses a web-based system to provide energy consumption forecasting and usage data so each customer knows how much energy they are using. This allows customers to compare efficiency over time and to better manage their systems for greater efficiencies.



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### **How does Seattle Steam’s efficiency compare to other heat sources?**

From cradle to grave (or source to site, using ENERGY STAR terms), District Energy systems like Seattle Steam remain a more efficient way of delivering energy. Seattle Steam’s energy is produced and delivered within a very small footprint – 18 miles of pipe under approximately one-square mile of downtown Seattle. By comparison, electricity and natural gas fed to buildings is produced hundreds of miles away and still must be converted to heat at the building site.

The benefit of the Seattle Steam system is that since it serves so many customers from two locations, it can create efficiencies and opportunities that individual buildings and customers usually cannot. Seattle Steam can use a variety of conventional fuels, such as natural gas or oil, and it can also transition to use renewable fuels such as biomass, or a combination of fuels. This provides fuel efficiency and pricing flexibility.

### **What can you tell me about Seattle Steam’s biomass operations?**

The downtown Seattle plant features a biomass boiler. In its operation, Seattle Steam is only permitted to burn clean waste wood from approved sources. Of the four boilers operated in this plant, three are gas fired, while the fourth is a state of the art, high efficiency biomass boiler which burns clean waste wood. The biomass quality is controlled by a Wood Fuel Monitoring Plan approved by the Puget Sound Clean Air Agency which also permits and monitors emissions from all our boilers. Each wood supplier certifies that the wood provided to the biomass boiler meets the rigorous standards specified the Wood Fuel Monitoring Plan. With this biomass boiler in place Seattle Steam can cut its fossil based CO2 emissions by nearly 50 percent.

### **What about Particulate and NOx Emissions?**

Seattle Steam's permitted particulate emissions are about equivalent to 80 household fireplaces, except its operations are heating almost 18,000,000 square feet of building space. Its NOx emissions, which are also regulated by PSCAA, have been mostly offset by not burning natural gas as the company did before in its older gas fired boiler that was replaced when the biomass plant was installed.



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### **What do you have to say about claims that Seattle Steam is building an incinerator in Pioneer Square?**

Seattle Steam is currently planning to build a Combined Heat and Power (CHP) plant fueled by natural gas. The waste heat generated by the production of electricity will be captured and used to heat downtown Seattle office buildings reducing emissions Seattle Steam's gas fired boilers; *net emissions will therefore be reduced.*

### **Why recover waste heat?**

Waste heat energy is considered one of the most abundant untapped renewable energy sources in the world. If similar steps were taken in all cities, greenhouse gases from the production of electricity from coal could be reduced by 80 percent. By using Combined Heat and Power (CHP), Denmark has lowered its greenhouse gases in the past 30 years by 20 percent while increasing its GDP by 80 percent.

The U.S. Department of Energy (DOE) has estimated that increasing CHP from its current nine percent share of U.S. electric power to 20 percent by 2030 would avoid 60 percent of the projected increase in U.S. carbon dioxide emissions, equivalent to taking half of all U.S. passenger vehicles off the road.

### **Why are Seattle Steam's rates higher than rates for other utilities?**

Oftentimes when making comparisons between Seattle Steam and another utility, prospective customers neglect to include the costs for the value-added service that Seattle Steam provides: avoided capital investments, 24/7 service, reduced operating costs, and lower maintenance. Having an individual boiler in a building is expensive to own, operate and maintain, as well as takes up valuable space. When including all of those factors in a life cycle analysis, Seattle Steam's rates are very competitive in the marketplace.

Seattle Steam and its customers have actually paid less for natural gas on average over the past seven years than customers of Puget Sound Energy (38 percent lower between 2002 and 2009). Because it can buy directly from the source, Seattle Steam has been able to purchase futures at a competitive price. Seattle Steam's ability to be flexible in its fuel source and react to market prices is also a benefit. When the company experiences fuel savings, it passes those savings along to customers.



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### **Isn't District Energy an outdated method of delivering energy?**

It's true that District Energy has been in use in the United States since the late 1880s and Seattle Steam was one of the first pioneers of this type of system. However, electricity is another old technology! What the two share in common is a constant upgrading and adaptation. Seattle Steam has grown and improved as our urban areas have grown and changed. Today, District Energy is recognized by many urban planners as the preferred method of delivering heating and cooling.

The use of District Energy continues to grow. Since 1990, more than 420 million square feet of buildings space has been connected to North America District Energy systems. This growth shows that District Energy systems continue to innovate and provide an efficient and cost-effective means of providing energy to urban areas. The constant improvements and small footprint of these systems make them an important part of our energy future. Many of the most progressive and energy efficient cities in Europe use District Energy. Those cities include: Copenhagen, Denmark; Gothenburg, Sweden; Berlin, Germany and Reykjavik, Iceland.



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### **What has Seattle Steam done to modernize its facility and operations?**

Seattle Steam has a history of investing in new technology and innovation, as well as partnering with other local utilities and governments to provide superior service. In recent years, the company has introduced several new systems and collaborative partnerships:

- In 1987, Seattle Steam transferred 100 years of its maps and drawings of the steam distribution system to the City's Geographic Information System (GIS). This system allows all drawings and maps to be accessed by the City and the company faster and more accurately than ever before.
- Seismic upgrades completed in 1993 will allow the infrastructure to withstand the 1:2500 year design standard now used in Seattle.
- In November 2000, Seattle Steam began operating a waste heat recovery system which taps flue gas and its contained water vapor, increasing the company's efficiency.
- In early 2002, Seattle Steam updated its modeling tools to KYPIPE (an industry standard developed by the University of Kentucky), which allows engineers to get an immediate read on actual conditions within the steam system at any moment in time.
- In 2006, Seattle Steam updated its earthquake preparedness plan and is fully incorporated into the City of Seattle's Emergency Operations Center.
- In 2008, Seattle Steam completed a state-of-the-art digital plant control system designed to improve plant efficiencies and reliability to even higher standards.
- In the fall of 2009, Seattle Steam installed its biomass boiler, which has the capability of cutting its carbon emissions by 50 percent, making it one of the nation's leading renewable energy providers.

### **What about that steam I see coming out of the ground? Is that a leak?**

On colder days, people in Seattle will see steam rising from manholes and streets around downtown. Steam rising from the ground is a designed safety feature to remove condensate from pipes and is a standard part of the operation. The pipes are not "leaking" energy.

### **Is Seattle Steam regulated by the state utilities commission?**

Seattle Steam is not subject to regulation by the State of Washington utilities commission; the state only regulates monopolies. Because building owners have choices among energy providers and competitors, the state does not regulate Seattle Steam.



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### **Who owns Seattle Steam?**

Seattle Steam has been a family-owned business since 1974. The form of ownership is a limited partnership (Seattle Steam Limited Partnership), which is in turn owned by several trusts for the benefit of the family. The trusts are managed by a trustee.

### **Who is the CEO and how big is the company?**

Stan Gent serves as president and CEO. The company employs 28 people at two plants with headquarters in downtown Seattle.

### **Why did Seattle Steam switch to burning wood?**

Seattle Steam is concerned about climate change. As an energy provider, Seattle Steam recognizes its responsibility to reduce its carbon footprint and to help its customers do the same. That concern turned into action more than three years ago with a plan to add a biomass boiler to its production line in order to reduce carbon emissions. Installed in the fall of 2009, the new boiler system provides more flexibility in the types of fuel Seattle Steam may use to create energy. In addition, the introduction of biomass into the energy production stream provides more price stability at a time when the cost of traditional fossil fuels, such as natural gas and oil, can fluctuate wildly. A direct benefit is that the money spent on wood fuel to heat Seattle will be spent locally, as opposed to spending millions of dollars annually for natural gas from Canada.

### **Is biomass considered a renewable energy resource?**

Yes. The Department of Energy defines biomass as a substantial renewable resource that can be used as a fuel to generate energy. In addition, the U.S. Green Building Council recognizes wood as a renewable fuel source in its newest version of the LEED rating system. Seattle Steam is using clean urban waste wood in its biomass boiler. This is woody yard waste, broken wood pallets, clean construction demolition wood, shredded wood from real estate development land clearing, wood waste from sawmills and other clean wood debris. It provides a cost-effective alternative to natural gas and oil.



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### **Where does Seattle Steam get the wood it burns and how much will it use?**

The company has contracted with Cedar Grove Composting and others to provide the waste wood used to fuel the biomass boiler. Cedar Grove is assisting Seattle Steam in aggregating wood supply and encouraging waste collection companies in Seattle to deliver clean urban waste wood sorted from the waste stream. Approximately 10 to 12 truckloads of clean urban waste wood are delivered to the site daily. Seattle Steam uses approximately 250 tons per day.

### **What are the by-products of the wood boiler?**

The biomass boiler produces heat and a small amount of ash. The ash byproduct is removed and used in industrial applications, including as a protective sealant for landfills. Re-using ash results in a zero waste operation.

### **How is Seattle Steam able to continue burning wood during burn bans?**

Seattle Steam's process is very different and more controlled than burning wood in the fireplace in a single-family home, for example. The combustion process is managed with best available control technologies. The process is strictly regulated and emissions are monitored and reported to the Puget Sound Clean Air Agency.

### **Who provides regulatory oversight of Seattle Steam?**

Air quality compliance is implemented by the Title 5 air-quality permit requirements of the United States Environmental Protection Agency and is reviewed annually by the Puget Sound Clean Air Agency.



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### **Where does Seattle Steam get its water to create steam?**

Seattle Steam purchases water from Seattle Public Utilities and is a large consumer of water. To help offset that usage, Seattle Steam is able to produce seven percent of its own water. This occurs because natural gas is high in hydrogen, which combines with O<sub>2</sub> during combustion to actually produce water. Seattle Steam captures much of that water, along with the heat from the flue gas, before releasing it up the stack. Approximately 97 percent of the water delivered to Seattle Steam is fed through the system directly to its customers. Once steam is used as energy, the customer can either discharge the condensate to the sewer or re-use. Seattle Steam actively encourages its customers to recycle and re-use the condensate in other areas, such as laundry and landscape watering. The company is working with the City to encourage more customers to re-use the condensate in their operations.

### **How does Seattle Steam impact the environmental bottom line for building owners and operators?**

The impact is dramatic and immediate.

- Customers benefit from a reduction in their carbon footprint by 50 percent. Carbon footprint reduction is important to tenants, stockholders, the financial community and others who monitor corporate citizenship.
- The ENERGY STAR Portfolio manager, which is one of the best known and most heavily utilized measurement tools, rates District Energy systems like Seattle Steam quite high and this helps with third party “green” verification.
- Customers who re-use the steam condensate in their building operations are also able to gain additional LEED points toward building certification. Several new studies indicate that green certified buildings lease quicker and for higher rates than non-green buildings.