

Technical Support Document (TSD)
for the final Transport Rule
Docket ID No. EPA-HQ-OAR-2009-0491

Revised Capacity Factors Analysis for New Units

U.S. Environmental Protection Agency

Office of Air and Radiation

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Capacity Factors Analysis for New Units

This Technical Support Document (TSD) provides updated information that supports the EPA's determination of default capacity factors for new units to be adopted by the Transport Rule. Section V.D.4 in the preamble of the Transport Rule proposal described proposed assurance provisions that require the use of default capacity factors for new units without allowance allocations. In the TSD entitled "Capacity Factors Analysis for New Units (June 2010)" EPA documented how the proposed default capacity factors were determined for coal-fired boilers and combustion turbines. This TSD describes how EPA determined the final default capacity factors for those same unit types of units and other types of units using updated information now available. The TSD is organized as follows:

1. Introduction
2. Determination of default capacity factors

1. Introduction

Section VII.E of the preamble of the final Transport Rule describes EPA's assurance provisions. As described in the preamble, if the assurance provisions in a state are triggered, then EPA applies additional criteria to determine which source owners and operators in the state are subject to an allowance surrender requirement. In particular, the owners and operators of a group of sources having a common designated representative and having total emissions exceeding the common designated representative's share of the state budget must surrender allowances. The common designated representative's share of the state budget includes the total allocations of the units in the group. In the event that such a unit is a new unit receiving no allocation for the control period involved, EPA uses a surrogate allocation value that is calculated using a representative capacity factor.

A new unit's surrogate allocation number is calculated by multiplying the unit's allowable emissions rate (in lbs/MWe) by the unit's maximum hourly load (in MWe/hr), the default capacity factor for the unit type, and the number of days in the control period involved and divided by 2,000/lb/ton.

The default capacity factors for new units – which are presented in preamble section VII.E – are shown below in Table 1. This TSD describes how EPA determined these default capacity factors.

**Table 1. Default Capacity Factors for New Units
for Transport Rule Trading Programs
(Percentage)**

Unit Types	Annual SO₂ & NO_x Programs	Ozone Season NO_x Program
Coal-fired Steam Boiler	85	92
IGCC (coal gasification)	74	73
Oil-fired Steam Boiler	30	39
Natural Gas-fired Steam Boiler	44	47
Simple cycle combustion turbine	24	32
Combined cycle combustion turbine	66	71

2. Determination of Default Capacity Factors

EPA determined the default capacity factors for new units in Table 1 based on analysis of capacity factors using data reported to EPA by source owners and operators as part of EPA’s emissions trading programs. These programs require industry sources to report hourly emissions data each quarter.

Using the reported data, EPA calculated both annual and ozone season capacity factor for each unit between the years 2008 and 2010¹. For this analysis, we removed any partial years from the data sets. In general, EPA focused this analysis on units that commenced commercial operation after the year 2000.² However, as discussed in section VII.D.2 of the preamble, some units commencing operation in 2000 or earlier (such as older units that are not initially but later become subject to the Transport Rule trading

¹ EPA also calculated capacity factors for 2000-2007 and 2000-2010 and selected the use of the capacity factors from 2008 through 2010 because this time period is thought to be more representative of present conditions. Note that, in the June 2010 analysis performed for the proposed rule, the capacity factors were calculated from all data from 2000 through 2009 for coal and from 2004 through 2009 for combustion turbines. In this final analysis EPA has chosen to rely on the more representative, recent data.

² Note that the analysis done for the proposed rule utilized data from units commencing operation beginning in year 1999 or later.

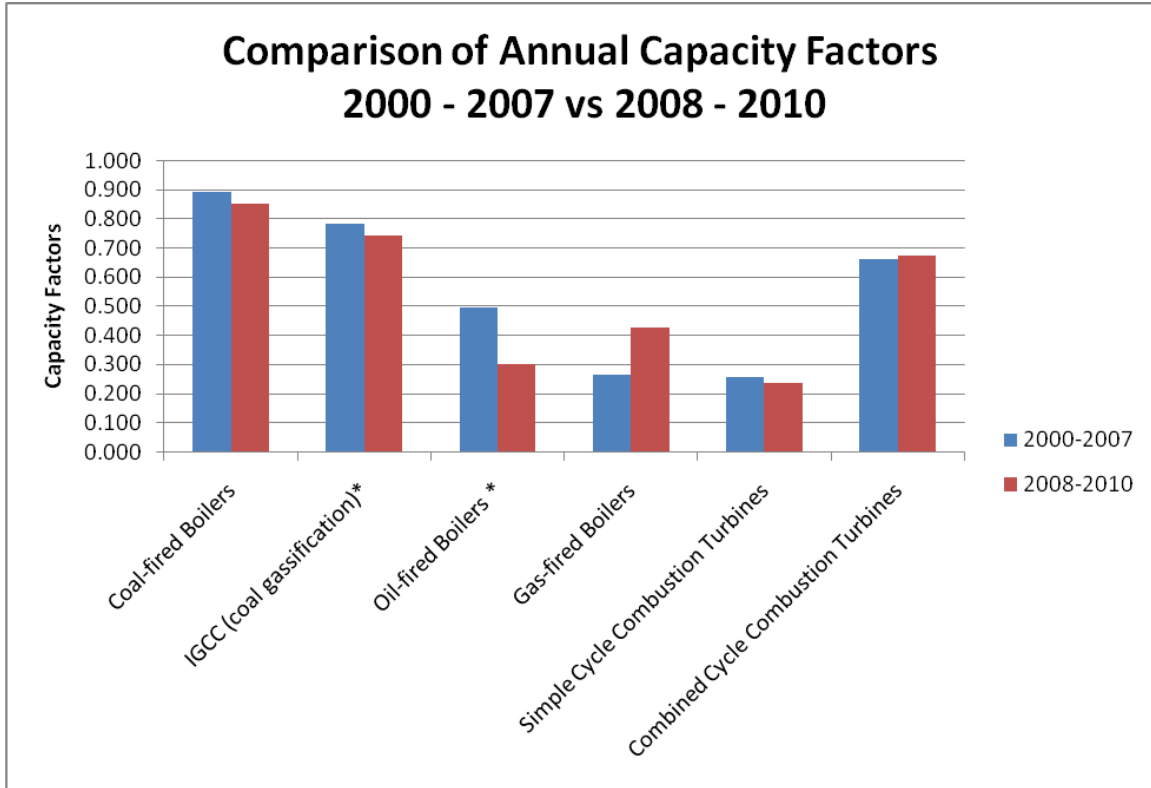
program) can be treated as new units and may need surrogate allocation values. For the unit types of IGCC and oil-fired boiler, no recently constructed units exist. Therefore, EPA used data from 2008 through 2010 from all existing units of those unit types to derive appropriate capacity factors to be applied to any such new units.

To determine annual capacity factors, EPA calculated the capacity factor for units reporting in electrical load units (MW) by dividing the gross electrical output (MWhr) by the maximum hourly load times 8,760 hours (the number of hours in a year). For units reporting in steam units (KLBsteam), i.e., coal boilers only, we divided the total mass of steam produced by the maximum steam rate times 8,760 hours. The maximum hourly load or maximum steam rate is reported to EPA. From these annual capacity factors EPA then determined the 95th percentile values of capacity factors for each unit type.

To determine ozone-season capacity factors, EPA performed the same calculations, except based on the potential load during the 3,672 hours of the ozone-season control period, rather than 8,760 hours.

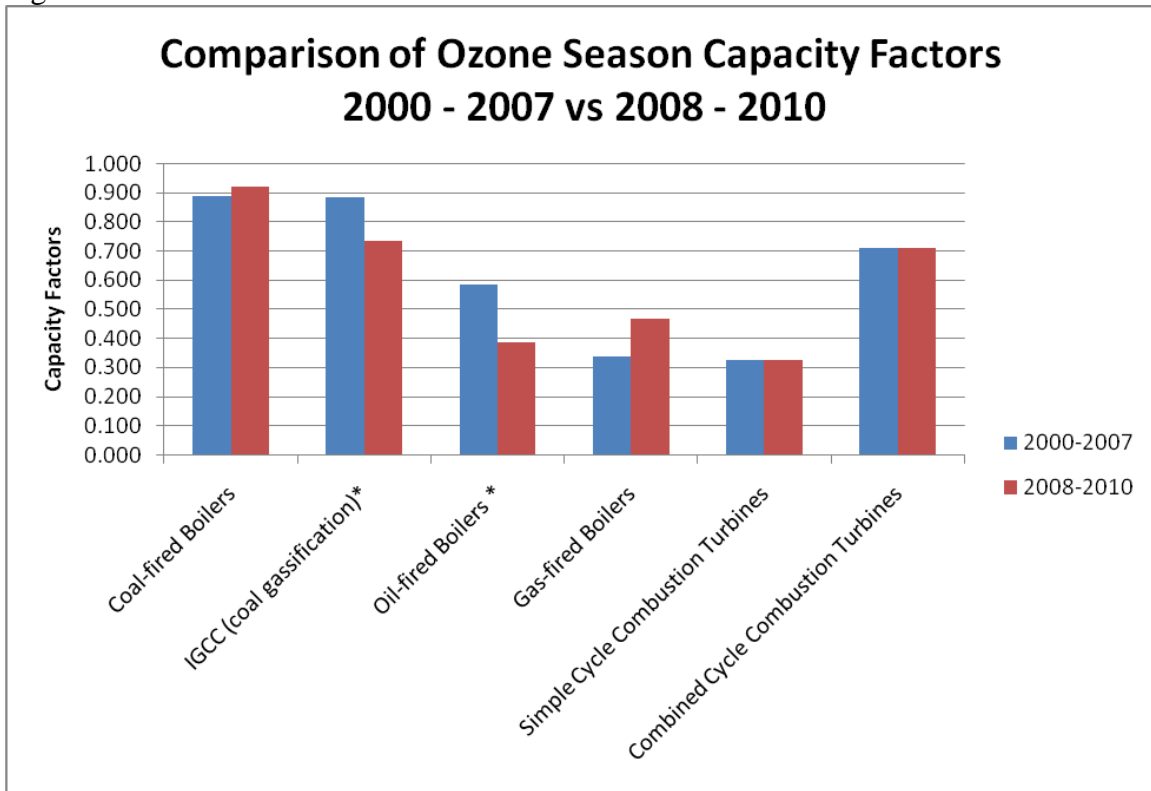
As described in the original TSD analysis, EPA chose the 95th percentile annual capacity factors for use as default capacity factors for new units in the Transport Rule annual and ozone season trading programs. EPA believes that this approach will take into account a reasonable range of operating conditions for new units.

Figure 1



* Unit types for which existing units (units that commenced operation before 2000) were used.

Figure 2



* Unit types for which existing units (units that commenced operation before 2000) were used.