

## Wisconsin Electric's Supply Planning Analysis for the Elm Road Generating Station

including:

- Planning Assumptions
- EGEAS Background and Methodology
- Primary Results
- Sensitivity Analyses and Results

May 22, 2003

# 1.0 EXISTING SUPPLY

## 1.1 GENERATION

Based on summer 2002 Mid America Interconnected Network (MAIN) ratings, Wisconsin Electric currently owns 5,836 MW of generating capacity located in Wisconsin and the Upper Peninsula of Michigan. This capacity consists of 62 percent coal-based units, 20 percent gas-and oil-based units, 17 percent nuclear, and 1 percent hydro.

Port Washington Units 1 through 4 went on-line between 1935 and 1949. Excluding Port Washington, the average age of Wisconsin Electric's coal units is more than 35 years. The last coal units added by Wisconsin Electric were Pleasant Prairie 2 and Edgewater 5, both added in 1985. Since 1985, five coal units have been retired by WE: Port Washington Unit 5 and Oak Creek units 1-4. All Wisconsin Electric capacity additions built after 1985 have been natural gas-based combustion turbines. Table 1-2 provides a list of the generating capacity by fuel type.

Capacity improvements at various plants totaling about 128 MW over the next ten years are expected.

The operating licenses for the two units at Point Beach will expire in 2010 and 2013. We have assumed that Point Beach will be re-licensed and remain in service in our PTF base case. However, the owners have not decided yet and may not seek re-licensing, or, if they do, they may not be successful. The PTF project implications of not re-licensing Point Beach are considered in the sensitivity analyses.

## 1.2 PURCHASES

Wisconsin Electric has several continuing long-term agreements in effect, including an agreement with LS Power-Whitewater, LP for 234 MW of gas based combined cycle capacity through May 2022. While LS Power initially developed and constructed the project, Cogentrix is now the managing partner and majority owner of LS Power-Whitewater, LP. Wisconsin Electric also has a long-term agreement in effect through May 2008 for 298 MW of gas simple cycle combustion turbine capacity with Mirant-Neenah, LLC, formerly SEI-Wisconsin, LLC and currently owned by the Mirant Corporation. Wisconsin Electric has an additional agreement with the Marquette Board of Light & Power for 30 MW from various sources through June 2005.

Wisconsin Electric has agreements in place with Calpine for a series of three 10-year purchases, each of which retires in May of the expiration year.

1. 150 MW of gas based simple cycle combustion turbine capacity in 2002-2011
2. 150 MW of gas based simple cycle combustion turbine capacity in 2003-2012
3. 150 MW of gas based simple cycle combustion turbine capacity in 2003-2007.

The first two of these Calpine units are operational. The third combustion turbine unit is fully permitted and is under construction.

Wisconsin Electric has a number of other contracts with Nipsco, Dynegy and Ameren for a total of 272 megawatts that expire in 2003. Another contract with WPPI for 65 megawatts is in place for 2004.

Wisconsin Electric also has a continuing long-term renewable energy contract with Waste Management Inc. -- 8 mw through October 2004, with Badger Windpower LLC (25.5 mw with an effective capacity of approximately 6 MW through May, 2011), with Ag Environmental Solutions LLC (0.75 mw through October, 2011), with Outagamie County (2.5 mw through February, 2006), and with Northern Iowa Windpower LLC (40 mw of renewable energy credits --no purchase of energy--through November, 2011).

Table 1-3 gives further information on power purchases.

### **1.3 SUPPLY GAP**

The supply deficit, the difference between projected demand -- including 18 percent reserves -- and net generation plus purchases is projected to grow to 2,520 MW in 2011. Table 1-4 provides a summary of the projected demand obligation and reserves from 2003 to 2011 and the calculated supply shortfalls.

Transmission likely will not improve the capacity deficit situation even if upgrades such as Arrowhead-Weston are completed. The need for reserves will exceed 18 percent if transmission capability additions do not keep pace with demand growth. Wisconsin is one of the least interconnected states in the region and will continue to be so even if the Arrowhead-Weston addition is completed.

## 2.0 SUPPLY PLANNING METHODOLOGY

Traditionally, electricity supply plans target the most economical and reliable mix of power supply additions and retirements, minimizing overall impact on our environment, our neighborhoods and our customers. While other states have emphasized a more market-driven approach to power plant construction, Wisconsin remains fairly traditional. Unlike merchant plants, the PTF generating units must be:

- Economic
- Needed
- Competitively neutral
- Superior to DSM
- Superior to renewables
- A correct mix of gas- and coal-based generating units

Both the PTF plan and merchant plants must be in the public interest and have acceptable environmental impacts.

### 2.1 PRIMARY CASES ANALYZED

Four primary cases or sets of assumptions are modeled in EGEAS. Plant in-service dates, technology choices, and fuel mix are then optimized by EGEAS using linear programming techniques given the input assumptions described below. The four cases are:

**(a) Power the Future (as proposed) Base Case:** This scenario matches the capacity additions for Wisconsin Electric proposed in the Power The Future plan:

- A 545-MW combined-cycle gas-based unit in 2005
- A second 545-MW combined-cycle gas-based unit in 2008
- A 515-MW<sup>1</sup> supercritical pulverized coal-based (SCPC) unit in 2007
- A second 515-MW SCPC unit in 2009
- A 500-MW integrated gasification combined-cycle combustion (IGCC) coal-based unit in 2011

All other construction is scheduled by EGEAS from the list of generation options described below. This base case cost is then compared against the cost of the other two cases.

**(b) Gas Only Case:** In order to model the manner in which Wisconsin Electric's generation will be supplied in the absence of the PTF plan, a gas only case has been created. In this case, EGEAS develops an optimized construction plan using a restricted list of generation options that does not allow the choice of coal-based alternatives. Comparison of the PTF base case to the gas only case allows EGEAS to determine the amount of savings

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<sup>1</sup> For planning purposes, the two SCPC and one IGCC coal units are modeled as 515, 515, and 500 MW net capacity available to WE. This assumes coal units of 615, 615 and 600 MW are built with partners who collectively control 100 MW per coal unit.

generated by the PTF plan's fuel diversity. Combined cycle units in the Gas Only case require the addition of an oil back-up capability in order to maintain system reliability.

(c) **EGEAS Optimized Case:** In this case, EGEAS is allowed to model an optimized plan with no restrictions on the type of generation assets it chooses. The PTF base case is then compared to the EGEAS optimized case in order to see how close the base case comes to this idealized least-cost option.

(d) **PTF without IGCC:** This case is identical to the base case, except that the third coal unit (the IGCC unit) does not have an assigned in-service date. The purpose of this case is to assess the degree to which assigning a 2011 in-service date to the IGCC unit affects the analysis.

## 2.2 DESCRIPTION OF EGEAS

Electric Generation Expansion Analysis System (EGEAS) is a modular production costing, generation expansion software that determines least-cost generation system expansion plans by comparing all combinations of multiple generation options to meet forecasted system load. EGEAS capabilities include:

- Generation expansion planning
- Reserve margin and supply reliability analysis
- Avoided cost analysis
- Environmental impact evaluation

EGEAS model inputs include:

- Forecasted energy and demand
- Known or expected energy purchases or sales
- Desired reserve margin
- Characteristics of existing and possible new generation units
- Fuel price forecasts
- Forecasted cost of emission allowances

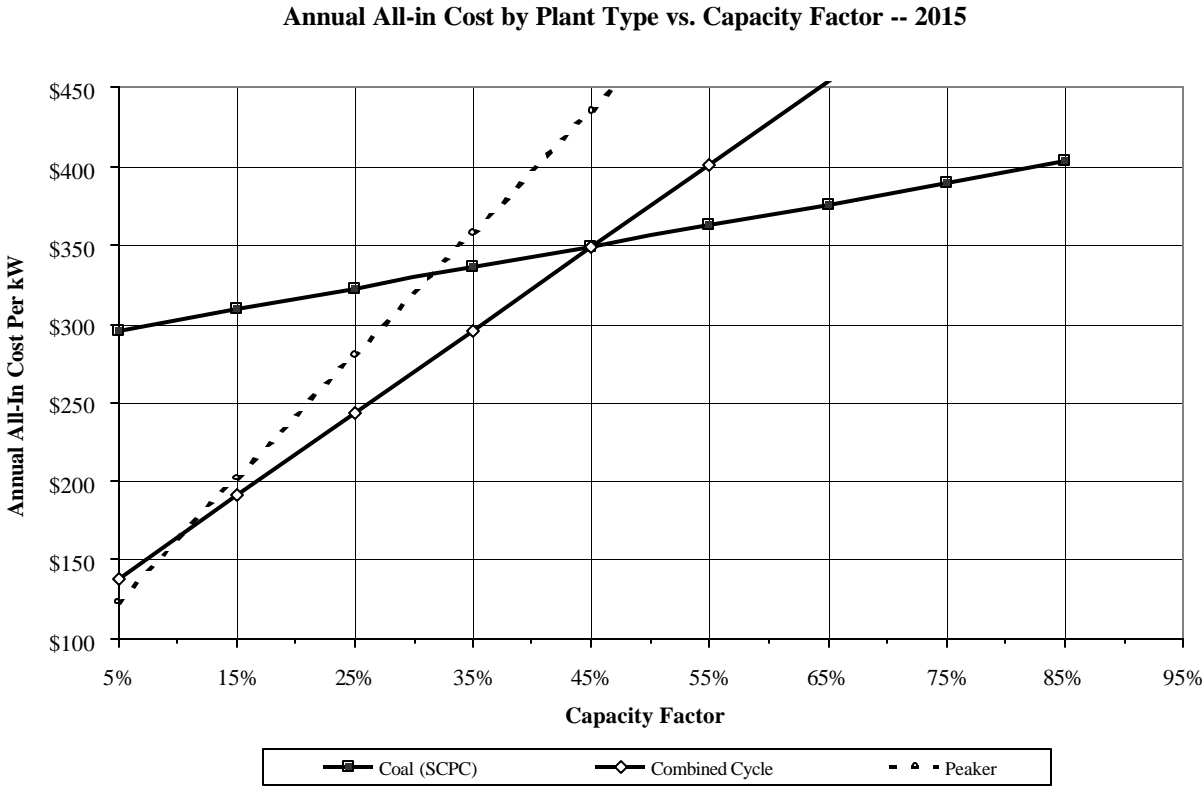
EGEAS uses linear programming to test all possible combinations of new generation units to meet load growth or replace existing resources assumed retired for analysis purposes. Each new unit is described by operating costs – heat rate, outage rates, variable costs – plus construction cost and carrying cost. EGEAS simulates the operation of the generation system year by year, and it finds the least-cost means of expanding the generation system to meet existing and future load over the defined analysis horizon. EGEAS then reports out feasible plans ranked from lowest cost to highest cost.

## 2.3 SCREENING CURVES

Generation planners often use screening curves as a quick check on the capacity mix of new units. Screening curves show the relative economics of various new generation alternatives for single year. Typically, the most economic generation option will depend on the expected hours of operation which, in turn, depends on the operating cost of the unit. Generally, the cheaper a

unit is to operate – taking into account the cost of fuel, the efficiency and the cost of labor and materials required to operate the unit – the more hours a unit will run.

Figure 1 is a screening curve for new generation options over the time period 2005 to 2025 as viewed from 2015, the mid-point of the period. Since the costs that go into the screening curve are changing at different rates, particularly gas prices rising faster than coal prices, 2015 is a reasonable but approximate representation of the average screening curve for the period.



**Figure 1**

Figure 1 shows that the most economic generation choice for summer peaking use or expected capacity factors under 10 percent is simple-cycle combustion turbines (often referred to as peakers for just this reason). Peakers have low first costs but high operating costs. For intermediate duty -- operating less than half of the hours in the year -- combined cycle units are most economical. For base load units -- units with the lowest operating costs which are expected to operate day and night for most of the year -- coal units are the most economic. These results are consistent with the Power the Future plan since a mix of units is proposed to be operating in the 2005 to 2030 period. The screening curve is also consistent with how Wisconsin Electric expects the various unit types to operate given expected fuel prices.

Obviously, screening curves are too simplistic to capture all the variations in needs and costs over a 30 year planning horizon. EGEAS is used to capture not only variations in cost escalation rates but also variations from year to year in the load forecast, purchased power contracts, and existing unit capacity retirements or upgrades.

## 3.0 EGEAS INPUT ASSUMPTIONS

### 3.1 DEMAND AND ENERGY FORECAST

Demand and energy forecasts from Wisconsin Electric's load forecasting experts were used in EGEAS.

**Years 2012 to 2031:** The load forecast is extended into years 2012 to 2031 by taking the average native load growth rate of the forecast (2001-2011), and applying that average percentage increase uniformly to each remaining year of the study. These final forecast numbers for peak demand and system usage are then entered into the EGEAS model. Tables 1-1 and 1-5 list year-by-year demand and energy data.

### 3.2 EXISTING UNIT DATA

Existing units described in Section 1 were modeled in EGEAS. Unless noted below, existing unit data is similar to new unit data.

**Plant Retirements:** There are a number of units that are expected to be retired over the length of the study. Port Washington units 4 and 6 were retired in January 2003 for a loss of 97 megawatts of capacity. Port Washington units 1, 2 and 3 are expected to be retired by December 2004 for a loss of 225 megawatts.

In the April 29, 2003 Consent Decree between Wisconsin Electric and the US EPA and DOJ, Wisconsin Electric agreed to either control or retire six units. Based on preliminary studies, the base case assumption is Presque Isle units 1 through 4 and Oak Creek units 5 and 6 will retire by December 2012 for a loss of 703 megawatts.

All other units are assumed to retire after 60 years of service.

Point Beach nuclear plant is assumed to receive a 20 year license extension. Since nuclear facilities are allowed only one license extension, unit 1 is assumed to retire in 2031, and unit 2 in 2033.

**Fixed Costs and Capital Related Costs:** The model does not include fixed and capital related costs for existing units. Fixed expenses for existing units are the same in all of the sensitivities and scenarios considered in the analysis and are not relevant to the analysis.

**Environmental Data:** SO<sub>2</sub>, NO<sub>x</sub>, mercury, and particulate emissions are no longer included in the EGEAS model. SO<sub>2</sub> is the only monetized emission under current laws. In the Consent Decree, Wisconsin Electric is allowed to keep SO<sub>2</sub> allowances sufficient to cover the operations of the existing units and the new ERGS units. Therefore, SO<sub>2</sub> emissions or allowance costs will not affect the dispatch of new or existing units in future years. The Consent Decree also includes numerous new SO<sub>2</sub>, NO<sub>x</sub>, and particulate system-wide emission limits for the existing coal fired units that vary over time. In addition, the Consent Decree requires specific equipment to be installed on specific units and the addition of controls or the retirement of other units. A comprehensive unit-by-unit, year-by-year compliance plan detailing specific unit emission rates is not available at this time. Since EGEAS is an economic model, there is no longer a need to track SO<sub>2</sub>, NO<sub>x</sub>, mercury, and particulate emissions

CO2 emissions are monetized in a CO2 tax scenario so unit CO2 emission rates are still included in EGEAS.

### 3.3 NEW GENERATION OPTIONS

EGEAS can pick from the following new unit options to meet load obligations:

- 150-MW Combustion Turbine (natural gas)
- 545-MW Combined Cycle (natural gas)
- 515-MW Super Critical Pulverized Coal (bituminous coal)
- 500-MW Integrated Gasification Combined Cycle (IGCC-bituminous coal)
- 200-MW Wind
- 100-MW Biomass

Table 1-8 is a summary of the data inputs for the generic unit options used in the EGEAS model. Listed below is an explanation of the inputs.

**Plant Capacity:** Plant capacity is the expected summer capacity available to Wisconsin Electric for each unit. At this time, no capacity value is attributed to wind for reserve planning purposes because, consistent with our careful approach to reliability, wind is not dispatchable and wind PPA contract terms do not include a guaranteed summer capacity. Wisconsin Electric will consider a non-zero capacity credit once we have more experience with wind on our system and/or after an accreditation methodology is widely accepted in the industry. Wind is allocated in 200 megawatt (nameplate) unit sizes to reflect the size of Wisconsin Electric's recent request for wind proposals.

**Operating (lease) Life:** In the case of combined cycle, combustion turbine and wind power, a lease life of 25 years is used. The coal-based and biomass units use a lease life of 30 years. These timeframes are based on the life of the proposed facility lease, and may not reflect the actual economic life of the units. This information is not directly input into EGEAS, but is used when calculating fixed capital cost, which is explained below.

**Construction Cost:** Information on the construction cost per kilowatt of capacity is not input into EGEAS directly. The data is transformed into a stream of lease payments that increase at the rate of inflation. These costs are expressed as an annual cost per kilowatt-year for the capacity in 2003 dollars, and are then escalated in EGEAS over the plants' PTF lease term. Once transformed they are also known as **Fixed Capital Cost**. Since the lease life is shorter than the EGEAS study timeframe and extension period, the lease figures must be adjusted in a manner that maintains their present value, but accommodates any cost changes that may occur after lease expiration. This is done prior to entering the data into EGEAS and is done using a real levelized cost methodology that has been used by Wisconsin Electric and the PSCW in the past.

**Variable Operating and Maintenance Cost:** Variable operating and maintenance cost is expressed in cost per megawatt hour. Variable costs are escalated in the EGEAS model using an inflation rate based on the rate of change of the gross domestic product implicit price deflator (GDP-IPD).

**Fuel Cost:** Fuel costs are expressed in cost per million Btu and are based on Wisconsin Electric's delivered fuel price forecast from Wisconsin Electric's Commodity Resources

department. The forecast extends to 2025. Fuel prices are escalated after 2025 at the compounded rate of change from 2020 to 2025. The forecast prices are in nominal (year of occurrence) terms through 2025. Fuel-cost information is discussed in further detail in the sensitivity analysis section and in Table 1-6 which lists the fuel prices used in EGEAS.

**Fixed Operating and Maintenance Cost:** Fixed operating and maintenance cost is expressed on the basis of cost per kilowatt per year. This input is inflation adjusted in EGEAS.

**Heat Rate:** Estimates represent the average heat rate for the unit expressed in Btus per kilowatt hour. The heat rate for combined cycle plants is given for duct fired and non-duct fired operation.

Plant capacity in EGEAS is assigned in usage blocks. For instance, a 150-MW combustion turbine plant is assigned a block of capacity from 0 – 75 MW, 76 – 113 MW, and 114 – 150 MW. Each block is allocated a different heat rate. Dispatch for that plant is then done by block. Block incremental heat rates for the different types of new generation are detailed on Table 1-8.

**Forced Outage Rate:** The forced outage rate is expressed on an annual percentage basis. For existing units the forced outage rate is based on recent historical performance. For new capacity options the assumed forced outage rates are shown on Table 1-8.

**Planned Outage Rate:** The planned outage rate is expressed in terms of weeks per year. For existing units the planned outage rate is based on recent historical performance. For new capacity options the planned outage rates are shown on Table 1-8.

## 3.4 Wind Assumptions

Wind unit pricing and performance are based on the bids from received from developers in response to Wisconsin Electric to the December 2002 request for proposals for up to 200 megawatts of wind generation. The pricing and performance data is confidential but has been supplied to the PSCW.

As more wind generation is added to the Wisconsin Electric system, the variability and unpredictability of wind generation will increase Wisconsin Electric's costs for load balancing, regulation, and spinning reserves. A study performed by Electrotek for Wisconsin Electric estimates that 1,000 MW added to Wisconsin Electric's system by 2012 would result in a cost increase of at least \$2.09 per megawatt hour of wind generation. While the costs increase slightly as more wind is installed, for modeling simplicity, the \$2.09/MWh cost was used at all levels of wind capacity installation.

## 3.5 IGCC ASSUMPTIONS

A Sargent & Lundy study Wisconsin Electric commissioned described two heat rates for IGCC plants depending on the design specifics assumed. The low heat rate case used a value of 8,300 Btu/kWh. A high performing plant is assumed for the EGEAS model and this was best represented by the S&L low heat rate case.

Current IGCC technology is expected to yield an equivalent availability factor (EAF) of 77%. Future technology advances are expected to reach an EAF of 87%. For purposes of the EGEAS modeling, a value halfway between current and future technology are used or an EAF of 83%. Scheduled annual outages are assumed to be 4 weeks. By difference, the forced outage rate (FOR) is equal to 10% for an overall EAF of 83%.

### **3.6 ECONOMIC ASSUMPTIONS**

**The Project Discount Rate:** Project costs are discounted at 8.97 percent, which reflects Wisconsin Electric’s after-tax cost of capital on regulated investment.

**Inflation Rate:** Unless otherwise stated, such as in the case of fuel, an inflation rate of 1.9% is used in the study, and based on the forecasted rate of change in the Gross Domestic Product implicit price deflator (GDP-IPD) as obtained from Economy.com. The most recent inflation update, which is used in this study, is from January 2003.

### **3.7 POTENTIAL PARTNERS’ COAL UNIT CAPACITY**

For planning purposes, Wisconsin Electric assumes each PTF coal unit is built with partners who collectively control 100 MW per coal unit.

### **3.8 OPPORTUNITY SALES AND PURCHASES ASSUMPTIONS**

Opportunity sales or purchases are sales or purchases made at the margin, generally in the wholesale market, to efficiently dispatch generating units. As the name implies, opportunity sales or purchases depend heavily on the circumstances of the moment. For long term planning purposes, it is very hard to predict where marginal opportunities will arise since each market participant is making independent plans and commitments for supply. Wisconsin Electric’s philosophy is to plan for a high degree of self-sufficiency in long range supply. Therefore Wisconsin Electric does not include any opportunity sales or purchases in long range planning models.

Purchased power as a long-range supply option is not modeled explicitly because in the long run (after 3-5 years), capacity for long-term sales comes either from new plants or huge inventories. Since no one in the region has a huge inventory of unused and unsold plant capacity, long term purchased power deals will be based on new plants being built. This report already analyzes the optimal type of capacity (peaker vs. base load, etc.) based on new unit costs.

## 4.0 EGEAS BASE CASE RESULTS

### 4.1 SUMMARY

PTF as proposed saves about \$1.6 billion in net present value compared to a gas-only plan. When the in-service date of the third coal unit is allowed to “float” and the model is allowed to choose between available coal technologies (the "PTF without IGCC" plan), the savings over a gas-only plan increase to about \$1.8 billion. Both PTF plans are less affected by swings in natural gas prices than the gas-only option.

### 4.2 PTF BASE CASE

After PTF plan units are added in 2005 through 2011, EGEAS adds another combined cycle facility in 2013, and continually adds peaking units in the years 2012 through 2021. From 2022 through 2031 EGEAS adds six coal units and eight peaking units. 600 megawatts of wind is added in 2031.

Table 1-9 shows the EGEAS modeling results from the four primary scenarios: PTF base scenario, gas only scenario, the EGEAS optimized scenario and the PTF-without IGCC scenario. For each scenario the expansion plan is indicated by the capacity in megawatts added in each year for each capacity type. Under the PTF base case expansion plan is the net present value of the PTF Base Case. Under data blocks for the gas only scenario, EGEAS optimized scenario, and the PTF without IGCC scenario are the net present values of these plans and the differences between the net present value of the PTF Base Case and the other scenarios.

### 4.3 GAS VS. COAL

If only gas-based generation is built to meet demand, generation costs will increase significantly. Total NPV (in 2003\$) of the Gas Only plan in EGEAS is about \$1.6 billion more costly than the PTF base case and \$1.8 billion more costly than the "PTF without IGCC" case over the EGEAS planning period.

Specifically, the \$1.6 billion cost difference is the difference between the EGEAS runs for the PTF plan and the gas-only plan. Each EGEAS run includes a 28-year planning period (2004-2031) and a 30-year “extension” period. The purpose of the extension period is to allow plants built later in the planning period to recover their fixed costs. For example, without the extension period, a combined-cycle unit added in the 27<sup>th</sup> year would recover only a very small portion of its fixed costs and would appear, in EGEAS, much less economical than a peaking plant. Without taking into account end effects, it is likely that only peakers would be built towards the end of the planning period. This would be unrealistic. To counteract this tendency, the EGEAS extension period uses simplified assumptions: load is fixed, the generation mix is fixed (no plant additions or retirements), and costs are escalated. In this way, operating cost advantages can offset high first costs over a reasonable “run-out” period.

While the EGEAS planning period is a convenient way to measure savings, it does not correspond to either the coal plant lease duration or to the useful life of a typical coal unit. The EGEAS planning period ends in 2061; the 30-year coal unit lease for the 2007 coal unit ends in 2037, while a typical coal unit lasts 40-60 years, or until about 2047-2067.

## **4.4 EGEAS OPTIMIZED SCENARIO VERSUS THE PTF AND PTF WITHOUT IGCC SCENARIOS**

The EGEAS Optimized scenario is a mix of coal and gas units as well as other technologies such as wind and biomass. Without constraints, EGEAS builds new SCPC coal units in 2009 and 2011. Subsequent coal units are added in 2016, 2022, 2023, 2025, 2028, 2030 and 2031. No IGCC units are selected. The optimized plan builds combined-cycle units in 2005 (Port Washington Generating Station Unit 1), 2007 (PWGS Unit 2) and 2013. Peakers are added in the EGEAS Optimized scenario throughout the study period with particularly heavy peaker construction in the years 2012 through 2021. The optimized plan also builds 600 megawatts of wind generation in 2031.

The EGEAS Optimized plan total NPV cost is \$277 million lower the PTF plan. Several reasons for the cost difference include in-service timing and the selection of IGCC technology over SCPC for the third coal unit. In order to examine the significance of these factors another scenario was constructed that allows EGEAS to select the type of coal technology and the in-service timing for the third coal unit.

Under the PTF without IGCC scenario, the in-service dates for the first two coal plants remain the same as in the PTF scenario. The model still only builds three combined cycle units over the study period, and the in-service dates for these units remain the same as in the PTF scenario. There is a significant delay in the construction of the third coal unit, which goes in service in 2018 as compared to 2016 in the EGEAS Optimized scenario and 2011 in the PTF scenario. As in the EGEAS Optimized scenario, no IGCC unit is selected. Unlike the optimized case, the PTF without IGCC scenario builds 100 megawatts of biomass generation in 2031 and builds a of total 800 megawatts of wind generation in 2030 and 2031. The cost difference between the PTF without IGCC scenario and the EGEAS Optimized scenario is about \$32 million in present value terms.

## **4.5 EGEAS COSTS DIFFERENCES – WHAT’S SIGNIFICANT?**

A difference of at least \$50 million seems to represent the noise threshold for EGEAS runs. While this is subjective, it is based on several years of experience running a wide variety of big and small variations. The differences in EGEAS supply plans varying by \$50 million are typically in the timing of peaker units, the smallest increment of new capacity available to the model. Typically in plans with costs less than \$50 million apart, the timing and proportion of the larger coal and combined-cycle units is the same, particularly in the early years.

As described in the Sensitivity Analysis section, reasonable variations in the EGEAS input assumptions affect plan costs by \$200 million to \$3 billion.

In the 2002 Port Washington Generating Station docket, a threshold of \$50 million was used to evaluate the planning alternatives. In the 1992 Kimberly/Repap docket, \$50 million was about the cut-off for making the short list of alternative proposals. Inflation since 1992 would make that value somewhat higher today.

## 5.0 SCENARIO ANALYSIS

### 5.1 METHODOLOGY

**Sensitivities:** Up to this point comparisons between the scenarios (PTF, gas-only, EGEAS optimized, and the PTF without IGCC scenarios) considered only the base assumptions. Now each scenario will be re-run to measure the impact of changes in key variables on the timing of new units and the overall cost of the plans. By running these sensitivities an assessment can be made about which factors will have the most dramatic effect on generation planning and which plans fare well under a wide variety of future conditions.

### 5.2 COMPARISON OF IN-SERVICE TIMING DECISIONS AGAINST THE PTF BASE CASE

In reviewing the sensitivities, it is useful to compare in-service timing changes of the EGEAS Optimized plan to the PTF proposal and to the PTF without IGCC plan. PTF as proposed includes three coal units in 2007, 2009 and in 2011. It also proposes to build two combined cycle units in 2005 and 2008. Discussed below are the impacts of the EGEAS sensitivities on the EGEAS Optimized case.

### 5.3 DESCRIPTION AND RESULTS OF SENSITIVITY RUNS

**Low-Load Sensitivity (#2):** The base case load forecast is developed using primary economic information from Economy.com. The low-load sensitivity simply reduces the base case load forecast annual growth rate by 0.5 percent.

- Costs fall for all sensitivities due to lower energy demand. The EGEAS Optimized scenario experiences the greatest cost reduction, falling by \$2.199 billion. The cost of the PTF without IGCC sensitivity falls by \$2.103 billion, and the cost of PTF sensitivity increases by \$480.4 million, due to lower capacities.
- The PTF sensitivity makes adjustments for low load growth by not building a third combined cycle unit, instead of building one in 2013. Other adjustments are made in peaking capacity. The low load case resumes construction of SCPC units in 2022 in much the same way as in the base case.
- The EGEAS Optimized sensitivity builds combined cycle units in 2005 and 2008, and pushes the construction of coal units out to 2011 and 2013 from the base case in-service dates of 2009 and 2011.
- The PTF without IGCC sensitivity adjusts for low load growth by moving the construction of the third coal unit out from 2018 to 2022, and by adjusting the in-service date of peaking units. Unlike the PTF sensitivity, it continues to build a third combined cycle unit in 2013.

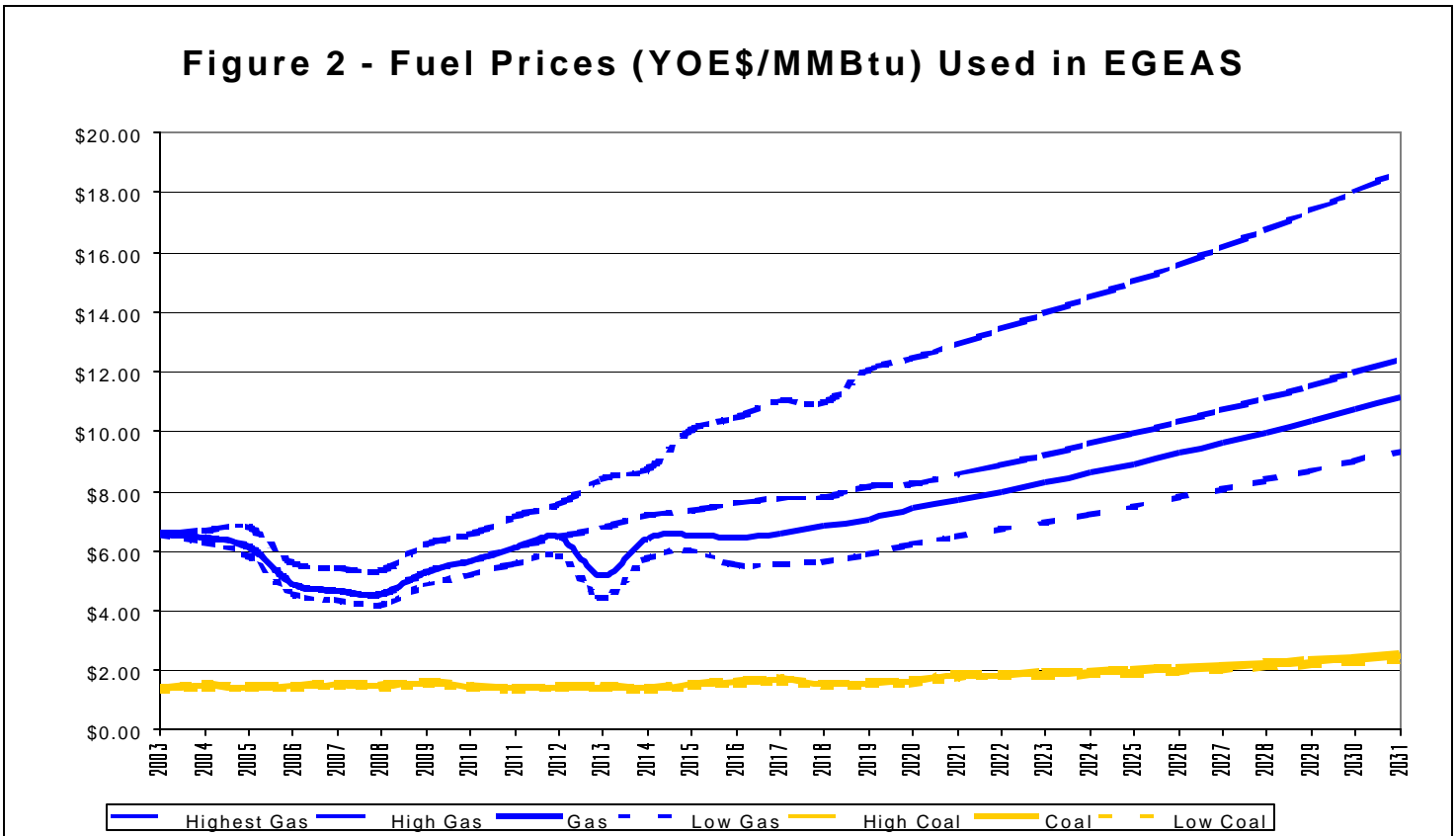
**High-Load Sensitivity (#3):** Similar to low-load sensitivity, the high-load sensitivity increases the annual load forecast growth rate by 0.5 percent.

- Costs of all sensitivities increase in this case due to increased energy production. The PTF without IGCC sensitivity costs increase by \$2.420 billion. Those of the PTF and Coal Optimized sensitivity increase identically by \$2.406 billion.
- The PTF sensitivity adjusts for increased load growth by building peaker units in 2005 and 2008, and by putting the fourth coal unit in-service in 2018, instead of 2022.
- The PTF without IGCC sensitivity moves construction of the third coal unit up to 2012 from 2018, and builds eight coal units instead of six in later years.
- The EGEAS Optimized sensitivity moves construction of third unit up to 2013 from 2016, and also speeds up the in-service of the fourth coal unit from 2022 to 2017. It also builds two more coal units in the later years. Combined cycle in-service dates remain the same.

**Low Natural Gas Price Sensitivity (#4):** The low priced natural gas sensitivity uses the most optimistic price forecast constructed by EEA and adopted by Wisconsin Electric for this analysis and is shown in Figure 2 – Fuel Prices used in EGEAS Modeling.

- The low gas price case drives down the cost of all three sensitivities. The PTF sensitivity falls by \$346.4 million. The PTF without IGCC sensitivity falls by \$375.0 million, and the EGEAS Optimized scenario falls by \$409.8 million.
- The PTF sensitivity builds one less coal unit in the later years, and relies more heavily on peaking units to compensate.
- The fourth coal unit is delayed one year from 2018 to 2019 in the PTF without IGCC sensitivity, and there are more peaking units added than in the base case.
- The EGEAS Optimized sensitivity builds the third combined cycle unit in 2008, instead of 2013, and defers the first two coal units two years from 2009 and 2011 to 2011 and 2013. It also relies more heavily on peaking units.

**Figure 2 - Fuel Prices (YOE\$/MMBtu) Used in EGEAS**



**High Natural Gas Price Sensitivity (#5):** The high natural gas price sensitivity uses the base case natural gas forecast developed by EEA, but changes it to reflect the possibility that increased natural gas supplies will not be available from Alaska.

- Costs increase by \$173.9 million in the PTF sensitivity, \$177.0 million in the PTF without IGCC sensitivity, and by \$187.2 million in the EGEAS Optimized sensitivity.
- The PTF sensitivity does not build a combined cycle unit in 2013, and compensates by building more peaking units. In the later years it also builds more wind generation.
- The PTF without IGCC sensitivity builds an additional coal unit in 2013 instead of building a third combined cycle unit.
- The EGEAS Optimized sensitivity speeds up the in-service dates of coal units, and pushes back the in-service date for the third combined cycle unit from 2013 to 2020. It also uses more peaking generation in the 2012 to 2020 time frame.

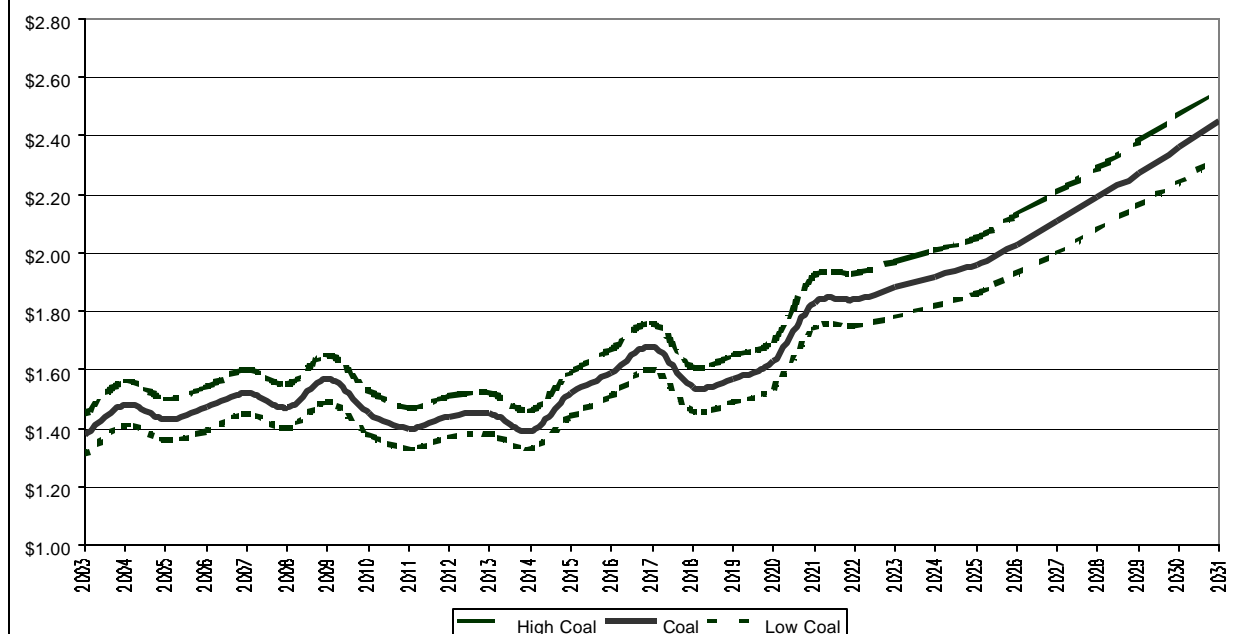
**Highest Natural Gas Price Sensitivity (#6):** The highest price sensitivity is a logical extension of the high price sensitivity. This sensitivity takes the assumptions used in the high gas price model and also assumes that it will continue to be difficult to maintain current domestic natural gas production.

- Sensitivity costs increase in the PTF sensitivity by \$678.3 million, by \$702.6 million in the PTF without IGCC sensitivity, and by \$740.4 million in the EGEAS Optimized sensitivity.
- The PTF sensitivity substitutes a coal unit for a combined cycle unit in 2013, and builds an additional 200 megawatts of wind generation. The wind generation also goes in-service sooner than in the base sensitivity.
- The PTF without IGCC sensitivity builds two coal units in 2013 in place of both combined cycle and peaking generation. It also begins construction of wind projects sooner than in the base case sensitivity.
- The EGEAS Optimized sensitivity also substitutes coal for combined cycle generation in 2013, and moves up the construction of other coal units from 2016 to 2012, and from 2022 to 2016. construction of wind generation is also accelerated.

**High Coal Price Sensitivity (#7):** The high coal price forecast is 10 percent higher than the base case forecast and is shown in Figure 3 – Coal Prices Used in EGEAS.

- Under this sensitivity costs increase for the PTF scenario by \$234.5 million, for the PTF without IGCC sensitivity by \$239.9 million and by \$238.7 million in the EGEAS Optimized sensitivity.
- The PTF sensitivity reacts to higher coal prices in the later years of the study. It builds more peaking units and one less coal unit. It also builds 200 megawatts more wind generation.
- The PTF without IGCC sensitivity make no changes in term of technology selection or in-service timing.
- The EGEAS Optimized sensitivity delays the first two coal units by two years, and moves the in-service date of the third combined cycle unit from 2013 to 2008.

**Figure 3 - Coal Prices (YOE\$/MMBtu) Used in EGEAS**



**Low Coal Price Sensitivity (#8):** The low coal price forecast is 10 percent lower than the base case.

- Costs fall by \$245.0 million in the PTF sensitivity, \$239.9 million in the PTF without IGCC sensitivity, and by \$239.7 million in the EGEAS Optimized sensitivity.
- The PTF, PTF without IGCC and EGEAS Optimized sensitivities make no changes in technology selection or in-service timings.

**Point Beach Retirement Sensitivity (#9):** Point Beach Nuclear Plant is assumed to be relicensed in the base case. This sensitivity assumes Point Beach unit one retirement in 2011 and Point Beach unit two retirement in 2013.

- The cost of the PTF sensitivity increases by \$2.055 billion. The PTF without IGCC sensitivity increases by \$2.102 billion, and the cost of the EGEAS Optimized sensitivity increases by \$2.089 billion.
- In all cases Point Beach capacity is replaced with new coal units. In the PTF without IGCC sensitivity additional coal capacity is substituted for peaking generation.

**Wind Production Tax Credit Sensitivity (#10):** In the base case scenario the wind production tax credit expires in December of 2003. In this sensitivity the production tax credit is extended through the end of the study.

- Extension of the PTC causes the cost of the PTF sensitivity to fall by \$130.3 million. The PTF without IGCC sensitivity drops by \$148.9 million, and the EGEAS Optimized sensitivity falls by \$333.5 million.
- In the PTF sensitivity 200 megawatts of additional wind generation is built, and the in-service timing of wind generation is moved up significantly from 2031 to 2017 through 2020. Significant reliance on a combination of added wind generation and more peaking generation displaces one coal unit in the later years of the study.
- In the PTF without IGCC sensitivity. An additional 200 megawatts of wind generation is added, and in-service times are moved up from 2031 to as early as 2011. Construction of a third coal unit is moved up to 2013 from 2018. These changes along with an increase in peaking generation displace the third combined cycle unit that would have been put in-service in 2013.
- A similar result occurs in the EGEAS Optimized sensitivity where 200 additional megawatts of wind is added, and the in-service timing of the wind generation is moved up from 2031 to as early as 2006. 300 megawatts of additional peaking generation is also added. The coal plants scheduled to go in-service in 2009, 2011 and 2016 are moved back to 2011, 2013 and 2017, and the need for a combined cycle unit in 2013 is eliminated.

**Wind Capacity Credit Sensitivity (#11):** In the base case EGEAS gives no capacity credit to wind generation. In the wind capacity sensitivity a 20% capacity credit is assigned to wind generation.

- The value of assigning a capacity value to wind is not as significant as the value of the production tax credit. Sensitivity costs are reduced by \$22.5 million from the PTF base case, \$24.8 million from the PTF without IGCC sensitivity, and \$38.2 million from the EGEAS Optimized sensitivity.
- Assigning a capacity value to wind does not cause a shift in the timing or selection of units in the PTF sensitivity, except that it puts 200 megawatts of wind generation in-service two years earlier and eliminates the need for one 150 megawatt peaking unit near the end of the study period.
- The PTF without IGCC sensitivity reacts in a similar manner. 200 megawatts of wind generation is moved up from 2030 to 2026 and one 150 megawatt peaking unit is eliminated.
- The EGEAS Optimized sensitivity adds 200 megawatts of wind generation in 2026, and eliminates the need for one peaking unit.

**Delayed First Unit In-Service Date Sensitivity (#12):** This sensitivity measures the effect of delaying the first Elm Road unit's in-service date one year from 2007 to 2008.

- Delaying the construction of the first coal unit by one year has minimal effect on the cost of the sensitivity. The impact on the PTF and the PTF without IGCC scenario is a cost reduction of \$16.1 million from each scenario's the base case. The effect on the EGEAS Optimized sensitivity is a cost savings of \$13.5 million.

**Declined Options Sensitivity (#13):** In this sensitivity both MG&E and WPPI decline their options to own 50 megawatts from each coal unit.

- The impact on the PTF sensitivity is a cost increase \$165.4 million, \$79.3 million on the PTF without IGCC sensitivity, and \$6.1 million on the EGEAS Optimized sensitivity.
- In the PTF sensitivity one less coal unit is built in the later years of the study, and one 150 megawatt peaking unit is added. Total coal capacity is reduced by 330 megawatts.
- In the PTF without IGCC sensitivity coal capacity is ultimately increased by 185 megawatts, and peaking capacity is reduced by 150 megawatts. In-service timings are not affected until the later years of the modeling.
- In the EGEAS Optimized sensitivity the first three coal units are delayed from 2009, 2011 and 2016 to 2011, 2013 and 2018. The third combined cycle unit is moved up from 2013 to 2008. This sensitivity reduces coal capacity by 330 megawatts and adds a 150 mw peaking unit as compared to its base case.

**Lease Extension Sensitivity (#14):** The lease extension sensitivity extends all coal and biomass leases twice. The first extension is for ten years at 50 percent of the original lease cost, and the second extension is for eight years at 15 percent of the original lease cost. Combined cycle units are also extended twice. The first extension is for eight years at 50 percent of the original lease price, and the second extension is for seven years at 15 percent of the original lease price. Peaking units are extended once for five years at 50% of the original lease price. Extensions don't apply to wind generation, which is assumed to be in the form of power purchases.

- Extending the leases reduces PTF sensitivity costs by \$570.2 million from the base case, \$527.8 million in the PTF without IGCC sensitivity, and by \$525.4 million in the EGEAS Optimized sensitivity.
- Lease extension does not affect the timing or technology selection of units until 2016 in the PTF sensitivity. Thereafter, the model builds an extra coal unit in 2018, and builds fewer peaking units (600 megawatts less).
- In the PTF without IGCC sensitivity the third combined cycle units is replaced by a coal unit in 2013, and 150 megawatts of additional peaking capacity is added.
- The EGEAS Optimized sensitivity moves up the construction of the third combined cycle unit from 2013 to 2007. The third coal unit is moved up from 2016 to 2013. These modifications shift the construction of peaking facilities to later in the study period.

**SCPC Low Capital Cost Sensitivity (#15):** In this sensitivity, the capital costs of supercritical coal units are assumed to be 10% lower than expected.

- The PTF sensitivity is \$215.8 million less costly. Costs fall by \$256.0 million in the PTF without IGCC sensitivity, and by \$254.5 million in the EGEAS Optimized sensitivity.
- In the PTF sensitivity an additional coal unit is built in 2018, which replaces peaking capacity.
- In the PTF without IGCC sensitivity the combined cycle plant that is scheduled for 2013 is replaced with a coal unit.
- The EGEAS Optimized sensitivity also replaces the 2013 combined cycle unit with a coal unit and adds 450 megawatts of peaking capacity.

**SCPC High Capital Cost Sensitivity (#16):** In this sensitivity, the capital costs of supercritical coal units are assumed to be 10% higher than expected.

- Higher construction costs for coal units results in increased sensitivity costs. The PTF sensitivity is increased by \$399.4 million. The PTF without IGCC sensitivity is increased by \$451.6 million, and the EGEAS Optimized sensitivity is increased by \$397.7 million.
- The PTF sensitivity builds one less coal unit in the later years, and replaces it with peaking units.
- The PTF without IGCC sensitivity makes only minor in-service timing modifications in the later years.
- The EGEAS Optimized sensitivity moves construction of the first two coal units back two years, and build one less coal unit in the later years, which is replaced with peaking units.

**Advanced Clean Coal Tax Credit Sensitivity (#17):** Consistent with the pending Senate energy bill (S. 597), a \$1.00 per megawatt hour production tax credit is given to the first coal unit, along with a 10% investment tax credit. The tax credit is applied to the lease for 30 years.

- The coal tax credit reduces costs by: \$103.1 million for the PTF sensitivity, \$102.5 million for the PTF without IGCC sensitivity, and by \$100.7 million for the EGEAS Optimized sensitivity.
- The coal tax credit has no effect on the in-service timing or technology selection of unit in the PTF sensitivity.
- The same is true of the PTF without IGCC sensitivity.

- In the EGEAS Optimized sensitivity the timing of the first coal unit is moved up from 2009 to 2008. One less coal unit is built in the later years, it is replaced by peaking capacity.

**Carbon Tax Sensitivity (#18):** One sensitivity was run which assumes that a \$3.00 (2010\$) per metric ton carbon dioxide tax is initiated in 2010, and that the price of the carbon tax increases at a rate of five percent per year thereafter.

The cost of the PTF sensitivity increases by \$1.176 billion. The PTF without IGCC sensitivity increases by \$1.174 billion, and the EGEAS Optimized sensitivity falls by \$1.157.8 billion.

- The PTF Base Case sensitivity builds one less coal unit in the later years. It substitutes 150 megawatts of peaking capacity and 300 megawatts of biomass to replace the coal unit.
- The PTF without IGCC sensitivity makes no significant changes to unit technology or timing in response to carbon taxes.
- The Optimized sensitivity speeds up the in-service date of the third combined cycle unit to 2007 from 2013. It then delays the in-service years of the first two coal units by two years. In later years it builds one less coal unit, replacing it with 300 megawatts of peaking capacity and 100 megawatts of biomass.

**EPA Settlement Sensitivity (#19):** Retirements associated with the EPA settlement are included as part of the base case. This sensitivity moves the retirements up from 2012 to 2008.

- Retirements that are scheduled as a result of the EPA settlement add cost to the sensitivity. The PTF sensitivity is increased by \$275.2 million. The PTF without IGCC sensitivity is increased by \$290.3 million, and the EGEAS Optimized sensitivity is increased by \$306.0 million.
- The PTF sensitivity eliminates the 2013 combined cycle unit, and replaces it with peaking generation. The fourth coal unit is moved from 2022 to 2015, and 200 megawatts of wind is moved from 2031 to 2024.
- The EPA settlement has little impact on the PTF without IGCC Sensitivity other than moving up the in-service schedules for some peaking units.
- The EGEAS Optimized sensitivity moves the construction of the third combined cycle unit from 2013 to 2007, and moves up the construction schedules for the peaking units.

## 5.4 SUMMARY OF SENSITIVITIES:

Tables 1-10 and 1-11 summarize the effect of the sensitivities against the base case scenario and against the "EGEAS Optimal" scenario. By making comparisons to the EGEAS Optimized

scenario it can be seen that the PTF plan performs in line with the EGEAS Optimized plan in the high demand sensitivity, but does worse in the low demand sensitivity. In the PTF case, low demand reduces capacity factors in the earlier years of the study and actually increases costs. When the third coal unit's in-service date is allowed to float as it does in the PTF without IGCC scenario, the PTF plan performs inline with the EGEAS Optimized scenario.

Low, high and highest natural gas pricing environments have about the same effect on all three scenarios, as do the high and low coal price environment sensitivities. This is also true of the Point Beach retirement sensitivity.

The EGEAS Optimized scenario lowers cost more than the two PTF scenarios by reacting faster to the extension of renewable credits. Also, in all three scenarios, assigning a capacity value to wind is inconsequential. Delaying the construction of the first Elm Road unit one year is also inconsequential.

If MG&E and WPPI were to decline their coal unit options, it would have virtually no impact on the EGEAS Optimized scenario, but would affect both of the PTF scenarios.

The effects of extending leases and the impacts of both low and high coal unit construction costs, the impact of tax credits, carbon taxes, and the EPA settlement move-up are also about the same among the three scenarios.

Table 1-11 shows how each sensitivity compares to the same sensitivity for the EGEAS Optimized scenario. For instance, The PTF base scenario is \$276.7 million higher than the EGEAS Optimized base scenario. The PTF without IGCC scenario is \$32.1 million more than the EGEAS Optimized scenario, and the Gas Only scenario is \$1,857.2 million more expensive than the EGEAS Optimized scenario. The sensitivity comparisons show the extent to which this difference is maintained throughout the different sensitivities.

There has been little discussion of an all gas scenario thus far. Table 1-11 demonstrates that such a proposal is much more expensive than the other options, and much more significantly impacted by the various sensitivities.

**Table 1 - 1  
Demand Obligation Forecast**

	2002	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	Avg	Change
Demand - MW	Actual	Normalized												
<b><u>Pre-Load Mgmt Native System Load</u></b>														
Excluding Mines	5,660	5,779	5,777	5,962	6,105	6,264	6,394	6,552	6,729	6,902	7,023	7,188		
Mine Load	208	208	220	220	220	220	220	220	220	220	220	220		
<b>Total Including Mines</b>	<b>5,868</b>	<b>5,987</b>	<b>5,997</b>	<b>6,182</b>	<b>6,325</b>	<b>6,484</b>	<b>6,614</b>	<b>6,772</b>	<b>6,949</b>	<b>7,122</b>	<b>7,243</b>	<b>7,408</b>		<b>1,411</b>
<b><u>Load Management</u></b>														
<b>Mines</b>	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)	(200)		
<b>Non-mine</b>	(143)	(143)	(143)	(143)	(143)	(143)	(143)	(143)	(143)	(143)	(143)	(143)		
<b>Net Native System</b>	<b>5,525</b>	<b>5,644</b>	<b>5,654</b>	<b>5,839</b>	<b>5,982</b>	<b>6,141</b>	<b>6,271</b>	<b>6,429</b>	<b>6,606</b>	<b>6,779</b>	<b>6,900</b>	<b>7,065</b>		<b>1,411</b>
<b>Annual Growth</b>			0.2%	3.3%	2.5%	2.7%	2.1%	2.5%	2.8%	2.6%	1.8%	2.4%	2.5%	
<b><u>Firm Sales</u></b>														
ESELCo	57	57	53	54	56	58	59	61	63	65	86	88		
WPPI PSA	180	180	210	240	225	225	175	150	100	50	-	-		
WPPI (New - PTF)	-	-	-	-	-	-	75	125	200	250	300	300		
Open Season	-	-	-	-	-	-	50	50	100	100	150	150		
<b>Total Firm Sales</b>	<b>237</b>	<b>237</b>	<b>263</b>	<b>294</b>	<b>281</b>	<b>283</b>	<b>359</b>	<b>386</b>	<b>463</b>	<b>465</b>	<b>536</b>	<b>538</b>		<b>275</b>
<b>Extra Losses When Mines Curtailed</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>	<b>5</b>		
<b>ATC Loss Socialization</b>	<b>2</b>	<b>2</b>	<b>4</b>	<b>6</b>	<b>8</b>	<b>8</b>	<b>8</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>9</b>	<b>9</b>		
<b>Total Demand Obligation</b>	<b>5,769</b>	<b>5,888</b>	<b>5,926</b>	<b>6,144</b>	<b>6,276</b>	<b>6,437</b>	<b>6,643</b>	<b>6,829</b>	<b>7,083</b>	<b>7,258</b>	<b>7,450</b>	<b>7,617</b>		<b>1,691</b>
<b><u>Reserves</u></b>														
<b>Reserve Margin</b>	<b>18%</b>	<b>18%</b>	<b>18%</b>	<b>18%</b>	<b>18%</b>	<b>18%</b>	<b>18%</b>	<b>18%</b>	<b>18%</b>	<b>18%</b>	<b>18%</b>	<b>18%</b>		
<b>Required Reserves</b>	<b>1,038</b>	<b>1,060</b>	<b>1,067</b>	<b>1,106</b>	<b>1,130</b>	<b>1,159</b>	<b>1,196</b>	<b>1,229</b>	<b>1,275</b>	<b>1,306</b>	<b>1,341</b>	<b>1,371</b>		
<b>Total Demand Obligation+Reserves</b>	<b>6,807</b>	<b>6,948</b>	<b>6,993</b>	<b>7,249</b>	<b>7,406</b>	<b>7,595</b>	<b>7,839</b>	<b>8,058</b>	<b>8,358</b>	<b>8,565</b>	<b>8,791</b>	<b>8,988</b>		<b>1,995</b>
Change from Previous Year			45	257	156	189	244	219	300	207	226	197		
Annual Growth Rate			0.6%	3.7%	2.2%	2.6%	3.2%	2.8%	3.7%	2.5%	2.6%	2.2%	2.8%	

NOTES:

WPPI = Wisconsin Public Power Inc.

ESEL = Edison Sault Electric

Native system load reflects non-renewal of BPMA.

**Table 1 - 2  
Existing Generation Capacity**

<b>COAL</b>			<b>GAS/OIL</b>		
	Capacity - MW	Year Installed		Capacity - MW	Year Installed
Port Washington 1	65	1935	Oak Creek 9	18	1968
Port Washington 2	80	1943	Point Beach 5G	15	1969
Port Washington 3	80	1948	Valley Diesel	5	1969
Total Port Washington	<u>225</u>		Germantown 1	63	1978
Milwaukee County	10	1954	Germantown 2	63	1978
Presque Isle 1	25	1956	Germantown 3	63	1978
Presque Isle 2	37	1962	Germantown 4	63	1978
Presque Isle 3	58	1963	Pleasant Prarie Diesels (1)	--	1980
Presque Isle 4	58	1966	Concord 1	94	1993
Presque Isle 5	88	1974	Concord 2	94	1993
Presque Isle 6	88	1976	Concord 3	94	1994
Presque Isle 7	88	1978	Concord 4	94	1994
Presque Isle 8	88	1978	Paris 1	100	1995
Presque Isle 9	88	1979	Paris 2	100	1995
Total Presque Isle	<u>618</u>		Paris 3	100	1995
Oak Creek 5	261	1959	Paris 4	100	1995
Oak Creek 6	264	1961	Germantown 5	93	2000
Oak Creek 7	298	1965	Total Gas/Oil	<u>1,159</u>	
Oak Creek 8	312	1967	<b>NUCLEAR</b>		
Total Oak Creek	<u>1,135</u>		Point Beach 1	512	1970
Valley 1	140	1968	Point Beach 2	514	1972
Valley 2	140	1969	Total Point Beach	<u>1,026</u>	
Steam Load	-13		Hydro: median conditions	<u>55</u>	
Total Valley	<u>267</u>		<b>Total</b>	<b>5,821</b>	
Pleasant Prarie 1	612	1980			
Pleasant Prarie 2	612	1985			
Total Pleasant Prarie	<u>1,224</u>				
Edgewater (WE share)	102	1985			
Total Coal	<b>3,581</b>				

Notes:  
1-Modeled at 5mw to represent both Valley and Pleasant Prairie diesels.  
2- July, 2003 MAIN ratings unless noted otherwise.

**Table 1 - 3**  
**Existing Purchases**

(in MW)

	<u>2003</u>	<u>2004</u>	<u>2005</u>	<u>2006</u>	<u>2007</u>	<u>2008</u>	<u>2009</u>	<u>2010</u>	<u>2011</u>	<u>2012</u>
<u>Non-Renewable Purchases</u>										
LS Power WW Base	234	234	234	234	234	234	234	234	234	234
SEI Wisconsin LLC (Neenah)	298	298	298	298	298	-	-	-	-	-
MQT BL&P	31	30	-	-	-	-	-	-	-	-
Calpine (Zion)	450	450	450	450	450	300	300	300	300	150
NIPSCO	70									
Dynegy	102									
Ameren	100									
WPPI		65								
<u>Renewables</u>										
Waste Management, Inc.	8	8	-	-	-	-	-	-	-	-
Badger Windpower, LLC	6	6	6	6	6	6	6	6	6	6
Ag Environmental Solutions, LLC	1	1	1	1	1	1	1	1	1	1
<b>Total Existing Purchases</b>	<b>1,300</b>	<b>1,092</b>	<b>989</b>	<b>989</b>	<b>989</b>	<b>541</b>	<b>541</b>	<b>541</b>	<b>541</b>	<b>391</b>

**Table 1 - 4  
Supply Gap**

Summer Peak - MW	2003	2004	2005	2006	2007	2008	2009	2010	2011
Demand Obligation incl. Reserves	6,993	7,249	7,406	7,596	7,839	8,058	8,358	8,565	8,791
Existing Capacity	5,895	5,895	5,895	5,895	5,895	5,895	5,895	5,895	5,895
System Upgrades	23	23	38	38	128	128	128	128	128
PW Retirements	(97)	(97)	(337)	(337)	(337)	(337)	(337)	(337)	(337)
Net Existing Capacity	5,821	5,821	5,596	5,596	5,686	5,686	5,686	5,686	5,686
Existing Purchases	1,300	1,092	989	989	989	541	541	541	541
Planned Purchases	20	386	279	479	171	233	45	226	46
Total capacity plus Purchases	7,141	7,299	6,864	7,064	6,846	6,460	6,272	6,453	6,273
<b>Surplus/(Shortfall) from 18% reserves</b>	<b>148</b>	<b>50</b>	<b>(542)</b>	<b>(532)</b>	<b>(993)</b>	<b>(1,598)</b>	<b>(2,086)</b>	<b>(2,112)</b>	<b>(2,518)</b>

**Table 1 - 5  
Load Forecasts Used in EGEAS**

**Base Case (and CO2 Tax Case):**

	Peak Demand (MW)	Annual Energy (GWh)
2003	5,926	31,840
2004	6,144	32,835
2005	6,276	33,379
2006	6,437	34,076
2007	6,644	34,884
2008	6,829	35,896
2009	7,083	36,942
2010	7,258	37,920
2011	7,450	38,704
2012	7,617	39,649
2013	7,795	40,423
2014	7,978	41,215
2015	8,166	42,024
2016	8,358	42,851
2017	8,555	43,696
2018	8,757	44,560
2019	8,964	45,443
2020	9,176	46,346
2021	9,373	45,074
2022	9,595	46,017
2023	9,822	46,981
2024	10,055	47,967
2025	10,295	48,974
2026	10,540	48,383
2027	10,490	49,436
2028	10,747	50,542
2029	11,010	51,611
2030	11,280	52,735
2031	11,557	53,885

**Low Demand:**

	Peak Demand (MW)	Annual Energy (GWh)
2003	5,898	31,701
2004	6,086	32,552
2005	6,187	32,946
2006	6,315	33,488
2007	6,489	34,137
2008	6,639	34,980
2009	6,856	35,851
2010	6,993	36,647
2011	7,148	37,253
2012	7,275	38,001
2013	7,409	38,575
2014	7,548	39,159
2015	7,689	39,752
2016	7,833	40,356
2017	7,980	40,970
2018	8,130	41,595
2019	8,283	42,231
2020	8,439	42,878
2021	8,578	41,340
2022	8,740	42,009
2023	8,905	42,690
2024	9,073	43,382
2025	9,245	44,086
2026	9,419	43,182
2027	9,297	43,910
2028	9,479	44,651
2029	9,665	45,405
2030	9,853	46,172
2031	10,046	46,952

**High Demand:**

	Peak Demand (MW)	Annual Energy (GWh)
2003	5,955	31,998
2004	6,202	33,119
2005	6,366	33,815
2006	6,560	34,673
2007	6,801	35,646
2008	7,023	36,835
2009	7,316	38,065
2010	7,533	39,238
2011	7,766	40,213
2012	7,978	41,371
2013	8,201	42,364
2014	8,433	43,385
2015	8,672	44,433
2016	8,918	45,509
2017	9,171	46,615
2018	9,432	47,751
2019	9,700	49,917
2020	9,977	50,115
2021	10,241	49,151
2022	10,533	50,415
2023	10,835	51,713
2024	11,145	53,048
2025	11,465	54,418
2026	11,793	54,204
2027	11,831	55,650
2028	12,179	57,134
2029	12,538	58,659
2030	12,907	60,226
2031	13,288	61,835

**Table 1 - 6**  
**Coal and Natural Gas Price Forecasts Used in EGEAS**

(in YOES\$)

<b>NATURAL GAS:</b>					<b>COAL:</b>			
	<u>Base Case:</u>	<u>Low:</u>	<u>High:</u>	<u>Highest:</u>		<u>Base Case:</u>	<u>Low:</u>	<u>High:</u>
2003	\$6.57	\$6.54	\$6.58	\$6.60	2003	\$1.38	\$1.31	\$1.45
2004	\$6.45	\$6.29	\$6.45	\$6.68	2004	\$1.48	\$1.41	\$1.56
2005	\$6.13	\$5.81	\$6.13	\$6.79	2005	\$1.43	\$1.36	\$1.50
2006	\$4.89	\$4.55	\$4.90	\$5.59	2006	\$1.47	\$1.39	\$1.54
2007	\$4.67	\$4.35	\$4.67	\$5.42	2007	\$1.52	\$1.45	\$1.60
2008	\$4.57	\$4.19	\$4.55	\$5.35	2008	\$1.47	\$1.40	\$1.55
2009	\$5.29	\$4.86	\$5.29	\$6.22	2009	\$1.57	\$1.49	\$1.65
2010	\$5.66	\$5.20	\$5.66	\$6.54	2010	\$1.45	\$1.38	\$1.53
2011	\$6.10	\$5.56	\$6.11	\$7.14	2011	\$1.40	\$1.33	\$1.47
2012	\$6.46	\$5.82	\$6.47	\$7.56	2012	\$1.44	\$1.37	\$1.51
2013	\$5.16	\$4.44	\$6.78	\$8.42	2013	\$1.45	\$1.38	\$1.52
2014	\$6.41	\$5.76	\$7.19	\$8.72	2014	\$1.39	\$1.33	\$1.46
2015	\$6.54	\$6.00	\$7.36	\$10.06	2015	\$1.52	\$1.44	\$1.59
2016	\$6.42	\$5.54	\$7.59	\$10.45	2016	\$1.59	\$1.51	\$1.67
2017	\$6.60	\$5.57	\$7.76	\$11.01	2017	\$1.68	\$1.60	\$1.76
2018	\$6.81	\$5.64	\$7.80	\$10.98	2018	\$1.54	\$1.46	\$1.61
2019	\$7.07	\$5.89	\$8.16	\$12.06	2019	\$1.57	\$1.49	\$1.65
2020	\$7.41	\$6.24	\$8.24	\$12.44	2020	\$1.63	\$1.54	\$1.70
2021	\$7.71	\$6.48	\$8.56	\$12.92	2021	\$1.83	\$1.74	\$1.92
2022	\$7.99	\$6.72	\$8.88	\$13.42	2022	\$1.84	\$1.75	\$1.93
2023	\$8.29	\$6.97	\$9.21	\$13.94	2023	\$1.88	\$1.78	\$1.97
2024	\$8.61	\$7.23	\$9.57	\$14.46	2024	\$1.92	\$1.82	\$2.01
2025	\$8.93	\$7.50	\$9.94	\$15.00	2025	\$1.96	\$1.86	\$2.05
2026	\$9.27	\$7.78	\$10.31	\$15.56	2026	\$2.03	\$1.93	\$2.13
2027	\$9.62	\$8.07	\$10.71	\$16.15	2027	\$2.11	\$2.00	\$2.21
2028	\$9.98	\$8.38	\$11.11	\$16.75	2028	\$2.19	\$2.08	\$2.29
2029	\$10.36	\$8.69	\$11.53	\$17.38	2029	\$2.27	\$2.16	\$2.38
2030	\$10.75	\$9.02	\$11.97	\$18.03	2030	\$2.36	\$2.24	\$2.47
2031	\$11.16	\$9.35	\$12.42	\$18.71	2031	\$2.45	\$2.33	\$2.56

**Table 1 - 7**

**Renewable Capacity Projections (prior to any generic EGEAS additions to meet load obligation)**

(in MW)

<b>Renewable Capacity (nameplate)</b>			
	<u>Wind:</u>	<u>Other:</u>	<u>Total:</u>
2003	26.8	16.4	43.2
2004	26.8	52.0	78.8
2005	226.8	43.3	270.1
2006	226.8	43.3	270.1
2007	226.8	43.3	270.1
2008	226.8	44.8	271.6
2009	226.8	44.8	271.6
2010	226.8	46.3	273.1
2011	276.8	51.3	328.1
2012	276.8	51.3	328.1
2013	306.8	51.3	358.1
2014	306.8	51.3	358.1
2015	306.8	56.3	363.1
2016	316.8	56.3	373.1
2017	316.8	61.3	378.1
2018	331.8	61.3	393.1
2019	331.8	66.3	398.1
2020	346.8	66.3	413.1
2021	346.8	71.3	418.1
2022	361.8	71.3	433.1
2023	361.8	76.3	438.1
2024	376.8	76.3	453.1
2025	376.8	81.3	458.1
2026	396.8	81.3	478.1
2027	396.8	86.3	483.1
2028	416.8	86.3	503.1
2029	416.8	91.3	508.1
2030	436.8	91.3	528.1
2031	436.8	96.3	533.1

Note: The renewable energy generated from this capacity meets or exceeds the 5% PTF renewable energy goal (as well as the 2.2% RPS)

**Table 1 - 8  
Operating Statistics of New Generation Options in EGEAS**

	Size	2003 Costs				Fuel per Mbtu:	Average Heat Rate btu/kwh	Forced Outage Rate:	Scheduled Outages:	CO2 Emission Rate lb/Mbtu
		Construction Cost \$/kw	VOM \$/mwh	FOM \$/kw-yr	Fixed Cap \$/kw-yr					
Bio-mass	100 mw	\$1,804	\$3.13	\$48.49	\$257.07	\$2.08	8,911	10.0%	4 weeks	0.00
Coal (bituminous)	515 mw	\$1,400	\$2.07	\$20.90	\$210.20	\$1.31	8,700	2.0%	4 weeks	206.00
Combined Cycle	545 mw	\$545	\$2.35	\$4.28	\$81.33	\$6.57	6,983	5.0%	2 weeks	118.90
Combined Cycle w. Oil Back-up	545 mw	\$596	\$2.35	\$4.28	\$88.88	\$6.57	6,983	5.0%	2 weeks	118.90
Combustion Turbine	150 mw	\$400	\$2.02	\$5.21	\$56.50	\$6.60	10,555	4.3%	2 weeks	118.90
Wind	200 mw	\$0	(confidential)					2.0%	0 weeks	0.00
IGCC	500 mw	\$1,437	\$0.85	\$34.75	\$243.25	\$1.39	8,300	10.0%	4 weeks	206.00

Notes:

- 1- A firm gas transport charge is assigned to combined cycle units at a rate of \$3.45 per kilowatt of capacity, and to combustion turbine units at a rate of \$6.08 per kilowatt of capacity.
- 2- Wind is given no capacity credit toward reserves.
- 3- A \$2.09 / MWh charge is added to wind generation to cover costs of additional spinning reserve margin due to wind resource variability (per Electrotek study).
- 4- For the gas-only scenario, new combined cycle units must have oil backup due to high capacity factors and fuel reliability requirement. (Only applies to gas-only scenario)

**Capacity Blocks by New Plant Type**  
Heat rates shown are incremental

EGEAS Capacity Allocations in megawatt blocks:

Blocks:	ONE	TWO	THREE	FOUR	Total Capacity:
Bio-mass	Block Capacity: 100				100
	Heat Rate: 8,911				
Coal	Block Capacity: 129	129	129	128	515
	Heat Rate: 11,305	7,945	3,715	8,235	
Combined Cycle	Block Capacity: 300	200	45		545
	Heat Rate: 7,520	5,770	8,794		
Combustion Turbine	Block Capacity: 37	38	37	38	150
	Heat Rate: 17,871	7,394	8,116	8,839	
IGCC	Block Capacity: 350	150			500
	Heat Rate: 9,700	5,033			
Wind	Block Capacity: 200				200
	Heat Rate:				

NOTES:

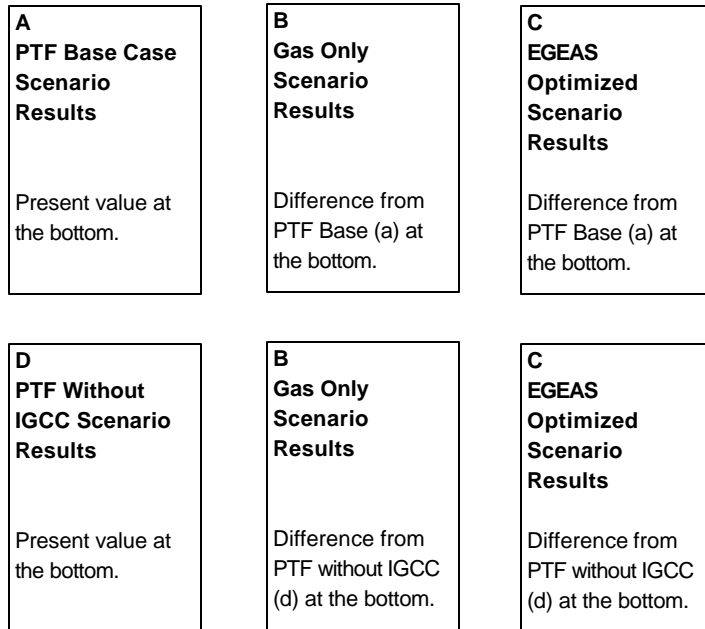
- 1- Fixed and variable operating costs increase with inflation at the rate of GDP-IPD.

# Key

**Table 1 - 9**

## How to Read the EGEAS Output Charts

- 1- The EGEAS study is broken into four scenarios and nineteen sensitivities.
- 2- The scenarios are: (a) PTF Base, (b) Gas Only, (c) EGEAS Optimized, and (d) PTF without IGCC.
- 3- There are reports for the results of each sensitivity. Each report has six charts that are arranged in the following manner:



## Key 2

### How to Read the EGEAS Output Charts (continued)

1- The charts show the scenario's construction schedule by technology type and by in-service year.

Technology type	EGEAS scenario						EGEAS sensitivity (1a)
	PTF Base Case: 1a						
Unit capacity (MW)	Pkr 150 MW	Coal 520 MW	IGCC 500 MW	CC 545 MW	Biomass 100 MW	Wind 200 MW	
In-Service Year by unit type and by capacity.	2003	0	0	0	0	0	0
	2004	0	0	0	0	0	0
	2005	0	0	0	545	0	0
	2006	0	0	0	0	0	0
	2007	0	515	0	0	0	0
	2008	0	0	0	545	0	0
	2009	0	515	0	0	0	0
	2010	0	0	0	0	0	0
	2011	0	0	500	0	0	0
	2012	300	0	0	0	0	0
	2013	450	0	0	545	0	0
	2014	300	0	0	0	0	0
	2015	150	0	0	0	0	0
	2016	300	0	0	0	0	0
	2017	150	0	0	0	0	0
	2018	300	0	0	0	0	0
	2019	150	0	0	0	0	0
	2020	300	0	0	0	0	0
	2021	150	0	0	0	0	0
	2022	0	515	0	0	0	0
	2023	0	515	0	0	0	0
	2024	0	0	0	0	0	0
	2025	450	515	0	0	0	0
	2026	300	0	0	0	0	0
	2027	0	0	0	0	0	0
	2028	0	515	0	0	0	0
	2029	300	0	0	0	0	0
	2030	0	515	0	0	0	0
	2031	150	515	0	0	0	600
Total construction by unit type	3750	4120	500	1635	0	600	
Total construction	10605						
	Cost through Extension Period						Net present value
	BASE =	20431.4 million					

1-Base

PTF Base Case: 1a

Gas Only Case: 1b

EGEAS Optimized Case:1c

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	0	500	0	0	0
2012	300	0	0	0	0	0
2013	450	0	0	545	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	515	0	0	0	600
	3750	4120	500	1635	0	600
	10605					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	0	0	0	1090	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	300	0	0	0	0	0
2018	0	0	0	545	0	0
2019	0	0	0	0	0	0
2020	150	0	0	0	0	0
2021	0	0	0	0	200	0
2022	0	0	0	545	0	0
2023	0	0	0	0	200	0
2024	300	0	0	0	0	0
2025	450	0	0	545	0	0
2026	150	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	200
2031	450	0	0	545	0	600
	4200	0	0	5450	400	800
	10850					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	600	0	0	0	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	515	0	0	0	0
2012	150	0	0	0	0	0
2013	600	0	0	545	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	0	515	0	0	0	0
2017	0	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	515	0	0	0	600
	3750	4635	0	1635	0	600
	10620					

Cost through Extension Period

BASE = \$ 20,431.4 million

Cost vs. PTF Base (a)

\$ 1,580.5  
7.74%

Cost vs. PTF Base (a)

\$ (276.7)  
-1.35%

PTF without IGCC: 1d

Gas Only Case: 1b

EGEAS Optimized Case:1c

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	600	0	0	545	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	0	515	0	0	0	0
2019	0	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	200
2031	150	515	0	0	100	600
	4050	4120	0	1635	100	800
	10705					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	0	0	0	1090	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	300	0	0	0	0	0
2018	0	0	0	545	0	0
2019	0	0	0	0	0	0
2020	150	0	0	0	0	0
2021	0	0	0	0	200	0
2022	0	0	0	545	0	0
2023	0	0	0	0	200	0
2024	300	0	0	0	0	0
2025	450	0	0	545	0	0
2026	150	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	200
2031	450	0	0	545	0	600
	4200	0	0	5450	400	800
	10850					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	600	0	0	0	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	515	0	0	0	0
2012	150	0	0	0	0	0
2013	600	0	0	545	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	0	515	0	0	0	0
2017	0	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	515	0	0	0	600
	3750	4635	0	1635	0	600
	10620					

Cost through Extension Period

BASE = \$ 20,186.8 million

Cost vs. PTF without IGCC (d)

\$ 1,825.1  
9.04%

Cost vs. PTF without IGCC (d)

\$ (32.1)  
-0.16%

## 2-Low Load

**PTF Base Case: 2a Low Load**

**Gas Only Case: 2b Low Load**

**EGEAS Optimized Case:2c Low Load**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	0	500	0	0	0
2012	300	0	0	0	0	0
2013	600	0	0	0	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	150	0	0	0	0	0
2018	150	0	0	0	0	0
2019	300	0	0	0	0	0
2020	150	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	0	0	0	0	0
2024	300	0	0	0	0	0
2025	300	515	0	0	0	0
2026	150	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	0	0	0	0	0	0
2030	300	0	0	0	0	0
2031	150	515	0	0	0	600
	3450	3090	500	1090	0	600
	8730					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	300	0	0	0	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	0	0	0	545	0	0
2012	150	0	0	0	0	0
2013	450	0	0	545	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	150	0	0	0	0	0
2018	150	0	0	0	0	0
2019	150	0	0	0	0	0
2020	0	0	0	0	200	0
2021	150	0	0	0	0	0
2022	0	0	0	545	0	0
2023	0	0	0	0	100	0
2024	150	0	0	0	0	0
2025	0	0	0	1090	0	0
2026	0	0	0	0	0	0
2027	0	0	0	0	0	0
2028	150	0	0	0	100	0
2029	300	0	0	0	0	0
2030	150	0	0	0	0	200
2031	300	0	0	545	0	600
	3450	0	0	4360	400	800
	9010					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	300	0	0	0	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	0	515	0	0	0	0
2012	150	0	0	0	0	0
2013	450	515	0	0	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	0	515	0	0	0	0
2018	0	0	0	0	0	0
2019	0	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	0	0	0	0	0
2024	300	0	0	0	0	0
2025	300	515	0	0	0	0
2026	150	0	0	0	0	0
2027	0	0	0	0	0	0
2028	300	0	0	0	0	0
2029	0	515	0	0	0	0
2030	0	0	0	0	0	0
2031	150	515	0	0	0	400
	3450	3605	0	1090	0	400
	8545					

Cost through Extension Period

BASE = \$ 20,911.8 million

Cost vs. PTF Base (a)

\$(1,539.8)  
-7.36%

Cost vs. PTF Base (a)

\$(2,956.1)  
-14.14%

**PTF without IGCC: 2d, Low Load**

**Gas Only Case: 2b Low Load**

**EGEAS Optimized Case:2c Low Load**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	0	0	0	0	0
2012	300	0	0	0	0	0
2013	450	0	0	545	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	150	0	0	0	0	0
2018	150	0	0	0	0	0
2019	150	0	0	0	0	0
2020	150	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	150	0	0	0	0	0
2024	0	515	0	0	0	0
2025	0	515	0	0	0	0
2026	150	0	0	0	0	0
2027	0	0	0	0	0	0
2028	300	0	0	0	0	0
2029	0	515	0	0	0	0
2030	0	0	0	0	0	0
2031	150	515	0	0	100	200
	2850	3605	0	1635	100	200
	8390					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	300	0	0	0	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	0	0	0	545	0	0
2012	150	0	0	0	0	0
2013	450	0	0	545	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	150	0	0	0	0	0
2018	150	0	0	0	0	0
2019	150	0	0	0	0	0
2020	0	0	0	0	200	0
2021	150	0	0	0	0	0
2022	0	0	0	545	0	0
2023	0	0	0	0	100	0
2024	150	0	0	0	0	0
2025	0	0	0	1090	0	0
2026	0	0	0	0	0	0
2027	0	0	0	0	0	0
2028	150	0	0	0	100	0
2029	300	0	0	0	0	0
2030	150	0	0	0	0	200
2031	300	0	0	545	0	600
	3450	0	0	4360	400	800
	9010					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	300	0	0	0	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	0	515	0	0	0	0
2012	150	0	0	0	0	0
2013	450	515	0	0	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	0	515	0	0	0	0
2018	0	0	0	0	0	0
2019	0	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	0	0	0	0	0
2024	300	0	0	0	0	0
2025	300	515	0	0	0	0
2026	150	0	0	0	0	0
2027	0	0	0	0	0	0
2028	300	0	0	0	0	0
2029	0	515	0	0	0	0
2030	0	0	0	0	0	0
2031	150	515	0	0	0	400
	3450	3605	0	1090	0	400
	8545					

Cost through Extension Period

BASE = \$ 18,083.6 million

Cost vs. PTF without IGCC (d)

\$ 1,288.4  
7.12%

Cost vs. PTF without IGCC (d)

\$(127.9)  
-0.71%

### 3-High Load

**PTF Base Case: 3a High Load**

**Gas Only Case: 3b High Load**

**EGEAS Optimized Case:3c High Load**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	150	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	150	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	0	500	0	0	0
2012	450	0	0	0	0	0
2013	450	0	0	545	0	0
2014	300	0	0	0	0	0
2015	300	0	0	0	0	0
2016	300	0	0	0	0	0
2017	300	0	0	0	0	0
2018	0	515	0	0	0	0
2019	150	0	0	0	0	0
2020	0	515	0	0	0	0
2021	0	0	0	0	0	0
2022	150	515	0	0	0	0
2023	300	0	0	0	0	0
2024	0	515	0	0	0	0
2025	300	0	0	545	0	0
2026	450	0	0	0	0	0
2027	0	0	0	0	0	0
2028	150	515	0	0	0	0
2029	0	515	0	0	0	0
2030	300	0	0	0	0	0
2031	0	1030	0	0	0	800
	4200	5150	500	2180	0	800
	12830					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	150	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	600	0	0	0	0	0
2009	0	0	0	545	0	0
2010	150	0	0	0	0	0
2011	0	0	0	545	0	0
2012	300	0	0	0	0	0
2013	450	0	0	545	0	0
2014	0	0	0	545	0	0
2015	0	0	0	0	0	0
2016	300	0	0	0	0	0
2017	300	0	0	0	0	0
2018	0	0	0	545	0	0
2019	150	0	0	0	0	0
2020	150	0	0	0	100	0
2021	300	0	0	0	0	0
2022	0	0	0	545	0	0
2023	150	0	0	0	200	0
2024	0	0	0	545	0	0
2025	150	0	0	545	100	0
2026	450	0	0	0	0	0
2027	0	0	0	0	0	0
2028	150	0	0	545	0	0
2029	450	0	0	0	0	0
2030	0	0	0	545	0	0
2031	300	0	0	545	0	800
	4500	0	0	7085	400	800
	12785					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	150	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	600	0	0	0	0	0
2009	0	515	0	0	0	0
2010	150	0	0	0	0	0
2011	0	515	0	0	0	0
2012	300	0	0	0	0	0
2013	0	515	0	545	0	0
2014	300	0	0	0	0	0
2015	300	0	0	0	0	0
2016	300	0	0	0	0	0
2017	0	515	0	0	0	0
2018	0	0	0	0	0	0
2019	0	515	0	0	0	0
2020	150	0	0	0	0	0
2021	300	0	0	0	0	0
2022	150	515	0	0	0	0
2023	300	0	0	0	0	0
2024	300	0	0	0	0	0
2025	0	1030	0	0	0	0
2026	450	0	0	0	0	0
2027	0	0	0	0	0	0
2028	600	0	0	0	0	0
2029	0	515	0	0	0	0
2030	0	515	0	0	0	0
2031	300	515	0	0	0	800
	4650	5665	0	1635	0	800
	12750					

Cost through Extension Period

BASE = \$ 22,840.0 million

Cost vs. PTF Base (a)

\$ 2,121.6  
9.29%

Cost vs. PTF Base (a)

\$ (277.1)  
-1.21%

**PTF without IGCC: 3d, High Load**

**Gas Only Case: 3b High Load**

**EGEAS Optimized Case:3c High Load**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	150	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	150	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	0	515	0	0	0	0
2013	450	0	0	545	0	0
2014	300	0	0	0	0	0
2015	300	0	0	0	0	0
2016	300	0	0	0	0	0
2017	0	515	0	0	0	0
2018	0	0	0	0	0	0
2019	0	515	0	0	0	0
2020	150	0	0	0	0	0
2021	300	0	0	0	0	0
2022	150	515	0	0	0	0
2023	300	0	0	0	0	0
2024	300	0	0	0	0	0
2025	0	1030	0	0	0	0
2026	450	0	0	0	0	0
2027	0	0	0	0	0	0
2028	150	515	0	0	0	0
2029	0	515	0	0	0	0
2030	300	0	0	0	0	0
2031	450	515	0	0	100	800
	4650	5665	0	1635	100	800
	12850					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	150	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	600	0	0	0	0	0
2009	0	0	0	545	0	0
2010	150	0	0	0	0	0
2011	0	0	0	545	0	0
2012	300	0	0	0	0	0
2013	450	0	0	545	0	0
2014	0	0	0	545	0	0
2015	0	0	0	0	0	0
2016	300	0	0	0	0	0
2017	300	0	0	0	0	0
2018	0	0	0	545	0	0
2019	150	0	0	0	0	0
2020	150	0	0	0	100	0
2021	300	0	0	0	0	0
2022	0	0	0	545	0	0
2023	150	0	0	0	200	0
2024	0	0	0	545	0	0
2025	150	0	0	545	100	0
2026	450	0	0	0	0	0
2027	0	0	0	0	0	0
2028	150	0	0	545	0	0
2029	450	0	0	0	0	0
2030	0	0	0	545	0	0
2031	300	0	0	545	0	800
	4500	0	0	7085	400	800
	12785					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	150	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	600	0	0	0	0	0
2009	0	515	0	0	0	0
2010	150	0	0	0	0	0
2011	0	515	0	0	0	0
2012	300	0	0	0	0	0
2013	0	515	0	545	0	0
2014	300	0	0	0	0	0
2015	300	0	0	0	0	0
2016	300	0	0	0	0	0
2017	0	515	0	0	0	0
2018	0	0	0	0	0	0
2019	0	515	0	0	0	0
2020	150	0	0	0	0	0
2021	300	0	0	0	0	0
2022	150	515	0	0	0	0
2023	300	0	0	0	0	0
2024	300	0	0	0	0	0
2025	0	1030	0	0	0	0
2026	450	0	0	0	0	0
2027	0	0	0	0	0	0
2028	600	0	0	0	0	0
2029	0	515	0	0	0	0
2030	0	515	0	0	0	0
2031	300	515	0	0	0	800
	4650	5665	0	1635	0	800
	12750					

Cost through Extension Period

BASE = \$ 22,606.8 million

Cost vs. PTF without IGCC (d)

\$ 2,354.8  
10.42%

Cost vs. PTF without IGCC (d)

\$ (43.9)  
-0.19%

### 4-Low Gas

**PTF Base Case: 4a Low Gas**

**Gas Only Case: 4b Low Gas**

**EGEAS Optimized Case:4c Low Gas**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	0	500	0	0	0
2012	300	0	0	0	0	0
2013	450	0	0	545	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	300	0	0	0	0	0
2024	300	0	0	0	0	0
2025	300	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	515	0	0	0	600
	4200	3605	500	1635	0	600
	10540					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	0	0	0	1090	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	300	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	0	0	545	0	0
2023	0	0	0	545	0	0
2024	0	0	0	0	0	0
2025	300	0	0	545	0	0
2026	150	0	0	0	100	0
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	0	0	0	545	0	0
2030	0	0	0	0	100	0
2031	150	0	0	545	200	0
	3600	0	0	5995	400	0
	9995					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	0	515	0	0	0	0
2012	300	0	0	0	0	0
2013	600	515	0	0	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	0	515	0	0	0	0
2017	0	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	300	0	0	0	0	0
2024	300	0	0	0	0	0
2025	300	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	0	515	0	0	0	200
	4050	4120	0	1635	0	200
	10005					

**Cost through Extension Period**

**BASE = \$ 20,085.0 million**

**Cost vs. PTF Base (a)**

**\$ 2,288.4**  
11.39%

**Cost vs. PTF Base (a)**

**\$ (340.1)**  
-1.69%

**PTF without IGCC: 4d, Low Gas**

**Gas Only Case: 4b Low Gas**

**EGEAS Optimized Case:4c Low Gas**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	600	0	0	545	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	300	0	0	0	0	0
2019	0	515	0	0	0	0
2020	0	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	300	0	0	0	0	0
2024	300	0	0	0	0	0
2025	300	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	0	515	0	0	100	200
	4050	4120	0	1635	100	200
	10105					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	0	0	0	1090	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	300	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	0	0	545	0	0
2023	0	0	0	545	0	0
2024	0	0	0	0	0	0
2025	300	0	0	545	0	0
2026	150	0	0	0	100	0
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	0	0	0	545	0	0
2030	0	0	0	0	100	0
2031	150	0	0	545	200	0
	3600	0	0	5995	400	0
	9995					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	0	515	0	0	0	0
2012	300	0	0	0	0	0
2013	600	515	0	0	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	0	515	0	0	0	0
2017	0	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	300	0	0	0	0	0
2024	300	0	0	0	0	0
2025	300	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	0	515	0	0	0	200
	4050	4120	0	1635	0	200
	10005					

**Cost through Extension Period**

**BASE = \$ 19,811.8 million**

**Cost vs. PTF without IGCC (d)**

**\$ 2,561.6**  
12.93%

**Cost vs. PTF without IGCC (d)**

**\$ (66.9)**  
-0.34%

## 5-High Gas

**PTF Base Case: 5a High Gas**

**Gas Only Case: 5b High Gas**

**EGEAS Optimized Case:5c High Gas**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	0	500	0	0	0
2012	300	0	0	0	0	0
2013	450	515	0	0	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	0	515	0	0	0	0
2021	0	0	0	0	0	0
2022	450	0	0	0	0	0
2023	300	0	0	0	0	0
2024	0	515	0	0	0	0
2025	150	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	450	0	0	0	0	200
2029	0	515	0	0	0	0
2030	150	0	0	0	0	0
2031	300	515	0	0	0	600
<b>Total</b>	<b>4200</b>	<b>4120</b>	<b>500</b>	<b>1090</b>	<b>0</b>	<b>800</b>
<b>10/10</b>	<b>10710</b>					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	0	0	0	1090	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	150	0	0	0	100	0
2018	150	0	0	0	100	0
2019	150	0	0	0	100	0
2020	150	0	0	0	100	0
2021	300	0	0	0	0	0
2022	0	0	0	545	0	0
2023	150	0	0	0	0	200
2024	300	0	0	0	0	200
2025	0	0	0	1090	0	0
2026	0	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	200
2031	450	0	0	545	0	200
<b>Total</b>	<b>4200</b>	<b>0</b>	<b>0</b>	<b>5450</b>	<b>400</b>	<b>800</b>
<b>10/850</b>	<b>10850</b>					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	600	0	0	0	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	515	0	0	0	0
2012	150	0	0	0	0	0
2013	600	515	0	0	0	0
2014	150	0	0	0	0	0
2015	0	515	0	0	0	0
2016	0	0	0	0	0	0
2017	150	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	0	0	0	545	0	0
2021	0	0	0	0	0	0
2022	0	515	0	0	0	0
2023	150	0	0	0	0	0
2024	0	515	0	0	0	0
2025	150	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	0
2031	450	515	0	0	0	800
<b>Total</b>	<b>3750</b>	<b>4635</b>	<b>0</b>	<b>1635</b>	<b>0</b>	<b>800</b>
<b>10/820</b>	<b>10820</b>					

Cost through Extension Period

BASE = \$ 20,605.3 million

Cost vs. PTF Base (a)

\$ 2,346.2  
11.39%

Cost vs. PTF Base (a)

\$ (263.4)  
-1.28%

**PTF without IGCC: 5d, High Gas**

**Gas Only Case: 5b High Gas**

**EGEAS Optimized Case:5c High Gas**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	600	515	0	0	0	0
2014	150	0	0	0	0	0
2015	300	0	0	0	0	0
2016	150	0	0	0	0	0
2017	0	515	0	0	0	0
2018	0	0	0	0	0	0
2019	150	0	0	0	0	0
2020	300	0	0	0	0	0
2021	300	0	0	0	0	0
2022	0	515	0	0	0	0
2023	150	0	0	0	0	0
2024	0	515	0	0	0	0
2025	150	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	450	0	0	0	0	200
2029	300	0	0	0	0	400
2030	0	515	0	0	0	0
2031	150	515	0	0	100	200
<b>Total</b>	<b>4200</b>	<b>4635</b>	<b>0</b>	<b>1090</b>	<b>100</b>	<b>800</b>
<b>10/825</b>	<b>10825</b>					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	0	0	0	1090	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	150	0	0	0	100	0
2018	150	0	0	0	100	0
2019	150	0	0	0	100	0
2020	150	0	0	0	100	0
2021	300	0	0	0	0	0
2022	0	0	0	545	0	0
2023	150	0	0	0	0	200
2024	300	0	0	0	0	200
2025	0	0	0	1090	0	0
2026	0	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	200
2031	450	0	0	545	0	200
<b>Total</b>	<b>4200</b>	<b>0</b>	<b>0</b>	<b>5450</b>	<b>400</b>	<b>800</b>
<b>10/850</b>	<b>10850</b>					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	600	0	0	0	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	515	0	0	0	0
2012	150	0	0	0	0	0
2013	600	515	0	0	0	0
2014	150	0	0	0	0	0
2015	0	515	0	0	0	0
2016	0	0	0	0	0	0
2017	150	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	0	0	0	545	0	0
2021	0	0	0	0	0	0
2022	0	515	0	0	0	0
2023	150	0	0	0	0	0
2024	0	515	0	0	0	0
2025	150	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	0
2031	450	515	0	0	0	800
<b>Total</b>	<b>3750</b>	<b>4635</b>	<b>0</b>	<b>1635</b>	<b>0</b>	<b>800</b>
<b>10/820</b>	<b>10820</b>					

Cost through Extension Period

BASE = \$ 20,363.8 million

Cost vs. PTF without IGCC (d)

\$ 2,587.7  
12.71%

Cost vs. PTF without IGCC (d)

\$ (21.9)  
-0.11%

## 6-Highest Gas

**PTF Base Case: 6a Highest Gas**

**Gas Only Case: 6b Highest Gas**

**EGEAS Optimized Case:6c Highest Gas**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	200
2011	0	0	500	0	0	0
2012	300	0	0	0	0	0
2013	450	515	0	0	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	0	515	0	0	0	0
2019	0	0	0	0	0	0
2020	300	0	0	0	0	200
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	300	0	0	0	0	200
2024	300	0	0	0	0	200
2025	300	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	515	0	0	0	200
	3750	4635	500	1090	0	800
	10775					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	300	0	0	0	100	0
2012	300	0	0	0	100	0
2013	0	0	0	1090	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	100	400
2016	150	0	0	0	0	200
2017	300	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	150	0	0	0	100	0
2021	300	0	0	0	0	0
2022	0	0	0	545	0	0
2023	150	0	0	0	0	0
2024	300	0	0	0	0	0
2025	0	0	0	1090	0	0
2026	0	0	0	0	0	200
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	0
2031	450	0	0	545	0	0
	4200	0	0	5450	400	800
	10850					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	515	0	0	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	0	515	0	0	0	0
2013	300	515	0	0	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	0	515	0	0	0	0
2019	0	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	200
2022	0	515	0	0	0	0
2023	300	0	0	0	0	200
2024	150	0	0	0	0	200
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	515	0	0	0	200
	3750	5150	0	1090	0	800
	10790					

Cost through Extension Period

BASE = \$ 21,109.7 million

Cost vs. PTF Base a

\$ 5,808.0  
27.51%

Cost vs. PTF Base a

\$ (214.6)  
-1.02%

**PTF without IGCC: 6d, Highest Gas**

**Gas Only Case: 6b Highest Gas**

**EGEAS Optimized Case:6c Highest Gas**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	0	1030	0	0	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	0	515	0	0	0	0
2019	0	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	200
2022	0	515	0	0	0	0
2023	300	0	0	0	0	200
2024	150	0	0	0	0	200
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	515	0	0	0	200
	3750	5150	0	1090	0	800
	10790					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	300	0	0	0	100	0
2012	300	0	0	0	100	0
2013	0	0	0	1090	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	100	400
2016	150	0	0	0	0	200
2017	300	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	150	0	0	0	100	0
2021	300	0	0	0	0	0
2022	0	0	0	545	0	0
2023	150	0	0	0	0	0
2024	300	0	0	0	0	0
2025	0	0	0	1090	0	0
2026	0	0	0	0	0	200
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	0
2031	450	0	0	545	0	0
	4200	0	0	5450	400	800
	10850					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	515	0	0	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	0	515	0	0	0	0
2013	300	515	0	0	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	0	515	0	0	0	0
2019	0	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	200
2022	0	515	0	0	0	0
2023	300	0	0	0	0	200
2024	150	0	0	0	0	200
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	515	0	0	0	200
	3750	5150	0	1090	0	800
	10790					

Cost through Extension Period

BASE = \$ 20,889.4 million

Cost vs. PTF without IGCC (d)

\$ 6,028.3  
28.86%

Cost vs. PTF without IGCC (d)

\$ 5.7  
0.03%

## 7- High Coal

**PTF Base Case: 7a High Coal**

**Gas Only Case: 7b High Coal**

**EGEAS Optimized Case:7c High Coal**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	0	500	0	0	0
2012	300	0	0	0	0	0
2013	450	0	0	545	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	200	0
2031	300	515	0	0	600	0
4200      3605      500      1635      0      800						
10740						

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	0	0	0	1090	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	300	0	0	0	0	0
2018	0	0	0	545	0	0
2019	0	0	0	0	0	0
2020	150	0	0	0	0	0
2021	0	0	0	0	200	0
2022	0	0	0	545	0	0
2023	0	0	0	0	200	0
2024	300	0	0	0	0	0
2025	450	0	0	545	0	0
2026	150	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	200	0
2031	450	0	0	545	0	600
4200      0      0      5450      400      800						
10850						

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	0	515	0	0	0	0
2012	300	0	0	0	0	0
2013	600	515	0	0	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	0	515	0	0	0	0
2017	0	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	515	0	0	0	600
3750      4635      0      1635      0      600						
10620						

Cost through Extension Period

**BASE = \$ 20,674.9 million**

Cost vs. PTF Base (a)

\$ 1,491.1  
7.21%

Cost vs. PTF Base (a)

\$ (281.5)  
-1.36%

**PTF without IGCC: 7d, High Coal**

**Gas Only Case: 7b High Coal**

**EGEAS Optimized Case:7c High Coal**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	600	0	0	545	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	0	515	0	0	0	0
2019	0	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	200	0
2031	150	515	0	0	100	600
4050      4120      0      1635      100      800						
10705						

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	0	0	0	1090	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	300	0	0	0	0	0
2018	0	0	0	545	0	0
2019	0	0	0	0	0	0
2020	150	0	0	0	0	0
2021	0	0	0	0	200	0
2022	0	0	0	545	0	0
2023	0	0	0	0	200	0
2024	300	0	0	0	0	0
2025	450	0	0	545	0	0
2026	150	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	200	0
2031	450	0	0	545	0	600
4200      0      0      5450      400      800						
10850						

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	0	515	0	0	0	0
2012	300	0	0	0	0	0
2013	600	515	0	0	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	0	515	0	0	0	0
2017	0	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	515	0	0	0	600
3750      4635      0      1635      0      600						
10620						

Cost through Extension Period

**BASE = \$ 20,426.7 million**

Cost vs. PTF without IGCC (d)

\$ 1,739.3  
8.51%

Cost vs. PTF without IGCC (d)

\$ (33.3)  
-0.16%

## 8-Low Coal

**PTF Base Case: 8a Low Coal**

**Gas Only Case: 8b Low Coal**

**EGEAS Optimized Case:8c Low Coal**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	0	500	0	0	0
2012	300	0	0	0	0	0
2013	450	0	0	545	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	515	0	0	0	600
<b>3750</b>	<b>4120</b>	<b>500</b>	<b>1635</b>	<b>0</b>	<b>600</b>	
<b>10605</b>						

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	0	0	0	1090	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	300	0	0	0	0	0
2018	0	0	0	545	0	0
2019	0	0	0	0	0	0
2020	150	0	0	0	0	0
2021	0	0	0	0	200	0
2022	0	0	0	545	0	0
2023	0	0	0	0	200	0
2024	300	0	0	0	0	0
2025	450	0	0	545	0	0
2026	150	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	200
2031	450	0	0	545	0	600
<b>4200</b>	<b>0</b>	<b>0</b>	<b>5450</b>	<b>400</b>	<b>800</b>	
<b>10850</b>						

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	600	0	0	0	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	515	0	0	0	0
2012	150	0	0	0	0	0
2013	600	0	0	545	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	0	515	0	0	0	0
2017	0	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	515	0	0	0	600
<b>3750</b>	<b>4635</b>	<b>0</b>	<b>1635</b>	<b>0</b>	<b>600</b>	
<b>10620</b>						

Cost through Extension Period

BASE = \$ 20,186.4 million

Cost vs. PTF Base (a)

\$ 1,743.9  
8.64%

Cost vs. PTF Base (a)

\$ (271.4)  
-1.34%

**PTF without IGCC: 8d, Low Coal**

**Gas Only Case: 8b Low Coal**

**EGEAS Optimized Case:8c Low Coal**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	600	0	0	545	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	0	515	0	0	0	0
2019	0	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	200
2031	150	515	0	0	100	600
<b>4050</b>	<b>4120</b>	<b>0</b>	<b>1635</b>	<b>100</b>	<b>800</b>	
<b>10705</b>						

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	0	0	0	1090	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	300	0	0	0	0	0
2018	0	0	0	545	0	0
2019	0	0	0	0	0	0
2020	150	0	0	0	0	0
2021	0	0	0	0	200	0
2022	0	0	0	545	0	0
2023	0	0	0	0	200	0
2024	300	0	0	0	0	0
2025	450	0	0	545	0	0
2026	150	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	200
2031	450	0	0	545	0	600
<b>4200</b>	<b>0</b>	<b>0</b>	<b>5450</b>	<b>400</b>	<b>800</b>	
<b>10850</b>						

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	600	0	0	0	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	515	0	0	0	0
2012	150	0	0	0	0	0
2013	600	0	0	545	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	0	515	0	0	0	0
2017	0	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	515	0	0	0	600
<b>3750</b>	<b>4635</b>	<b>0</b>	<b>1635</b>	<b>0</b>	<b>600</b>	
<b>10620</b>						

Cost through Extension Period

BASE = \$ 19,946.9 million

Cost vs. PTF without IGCC (d)

\$ 1,983.4  
9.94%

Cost vs. PTF without IGCC (d)

\$ (31.9)  
-0.16%

### 9-PB Retired EOL

**PTF Case: 9a PB to EOL**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	500	0	0	0
2012	300	0	0	0	0	0
2013	600	1030	0	0	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	0	515	0	0	0	0
2019	0	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	0	0	545	0	0
2024	0	0	0	0	0	0
2025	300	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	0	0	0	0	100	600
	3600	4635	500	1635	100	600
	11070					

Cost through Extension Period

BASE = \$ 22,496.8 million

**Gas Only Case: 9b PB to EOL**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	0	0	0	1090	0	0
2012	300	0	0	0	0	0
2013	450	0	0	1090	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	0	0	0	545	0	0
2019	0	0	0	0	0	0
2020	150	0	0	0	0	0
2021	150	0	0	0	100	0
2022	0	0	0	545	0	0
2023	0	0	0	0	200	0
2024	300	0	0	0	0	0
2025	300	0	0	545	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	150	0	0	0	100	0
2030	300	0	0	0	0	200
2031	450	0	0	0	0	600
	4200	0	0	5995	400	800
	11395					

Cost vs. PTF Base (a)

\$ 2,280.9  
10.14%

**EGEAS Optimized Case: 9c PB to EOL**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	600	0	0	0	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	1030	0	0	0	0
2012	150	0	0	0	0	0
2013	600	515	0	545	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	0	515	0	0	0	0
2018	0	0	0	0	0	0
2019	0	515	0	0	0	0
2020	0	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	300	0	0	0	0	0
2024	300	0	0	0	0	0
2025	300	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	0	0	0	0	600
	3750	5150	0	1635	0	600
	11135					

Cost vs. PTF Base (a)

\$ (253.2)  
-1.13%

**PTF without IGCC: 9d, PB to EOL**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	450	515	0	0	0	0
2012	300	0	0	0	0	0
2013	600	515	0	545	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	0	515	0	0	0	0
2018	0	0	0	0	0	0
2019	0	515	0	0	0	0
2020	0	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	300	0	0	0	0	0
2024	300	0	0	0	0	0
2025	300	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	0	0	0	0	600
	3750	5150	0	1635	0	600
	11135					

Cost through Extension Period

BASE = \$ 22,289.2 million

**Gas Only Case: 9b PB to EOL**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	0	0	0	1090	0	0
2012	300	0	0	0	0	0
2013	450	0	0	1090	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	0	0	0	545	0	0
2019	0	0	0	0	0	0
2020	150	0	0	0	0	0
2021	150	0	0	0	100	0
2022	0	0	0	545	0	0
2023	0	0	0	0	200	0
2024	300	0	0	0	0	0
2025	300	0	0	545	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	150	0	0	0	100	0
2030	300	0	0	0	0	200
2031	450	0	0	0	0	600
	4200	0	0	5995	400	800
	11395					

Cost vs. PTF without IGCC (d)

\$ 2,488.5  
11.16%

**EGEAS Optimized Case: 9c PB to EOL**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	600	0	0	0	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	1030	0	0	0	0
2012	150	0	0	0	0	0
2013	600	515	0	545	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	0	515	0	0	0	0
2018	0	0	0	0	0	0
2019	0	515	0	0	0	0
2020	0	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	300	0	0	0	0	0
2024	300	0	0	0	0	0
2025	300	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	0	0	0	0	600
	3750	5150	0	1635	0	600
	11135					

Cost vs. PTF without IGCC (d)

\$ (45.6)  
-0.20%

# 10-PTC to 2031

**PTF Base Case: 10a Renewable PTC to 2031**

**Gas Only Case: 10b Renewable PTC to 2031**

**EGEAS Optimized Case: 10c Renewable PTC to 2031**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	0	500	0	0	0
2012	300	0	0	0	0	0
2013	450	0	0	545	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	400
2018	300	0	0	0	0	0
2019	150	0	0	0	0	200
2020	300	0	0	0	0	200
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	300	0	0	0	0	0
2024	300	0	0	0	0	0
2025	300	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	515	0	0	0	0
	4200	3605	500	1635	0	800
	10740					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	600
2007	450	0	0	0	0	0
2008	600	0	0	0	0	0
2009	0	0	0	545	0	0
2010	0	0	0	0	0	0
2011	0	0	0	545	0	0
2012	150	0	0	0	0	0
2013	600	0	0	545	0	0
2014	150	0	0	0	0	0
2015	300	0	0	0	0	0
2016	150	0	0	0	0	0
2017	300	0	0	0	0	0
2018	150	0	0	0	0	0
2019	0	0	0	545	0	0
2020	0	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	0	0	545	0	0
2023	0	0	0	0	200	0
2024	0	0	0	545	0	0
2025	0	0	0	545	100	200
2026	150	0	0	0	100	0
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	0
2031	450	0	0	545	0	0
	4200	0	0	5450	400	800
	10850					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	600
2007	300	0	0	0	0	0
2008	600	0	0	0	0	0
2009	0	0	0	545	0	0
2010	0	0	0	0	0	200
2011	0	515	0	0	0	0
2012	150	0	0	0	0	0
2013	600	515	0	0	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	0	515	0	0	0	0
2018	0	0	0	0	0	0
2019	300	0	0	0	0	0
2020	150	0	0	0	0	0
2021	300	0	0	0	0	0
2022	0	515	0	0	0	0
2023	150	0	0	0	0	0
2024	0	515	0	0	0	0
2025	150	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	515	0	0	0	0
	4050	4635	0	1090	0	800
	10575					

Cost through Extension Period

BASE = \$ 20,301.1 million

Cost vs. PTF Base a

\$ 1,508.1  
7.43%

Cost vs. PTF Base a

\$ (479.9)  
-2.36%

**PTF without IGCC: 10d, Renew. PTC 2031**

**Gas Only Case: 10b Renewable PTC to 2031**

**EGEAS Optimized Case: 10c Renewable PTC to 2031**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	200
2012	300	0	0	0	0	0
2013	600	515	0	0	0	0
2014	150	0	0	0	0	0
2015	300	0	0	0	0	400
2016	150	0	0	0	0	0
2017	300	0	0	0	0	0
2018	150	0	0	0	0	200
2019	300	0	0	0	0	0
2020	150	0	0	0	0	0
2021	300	0	0	0	0	0
2022	0	515	0	0	0	0
2023	300	0	0	0	0	0
2024	150	0	0	0	0	0
2025	0	1030	0	0	0	0
2026	150	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	515	0	0	100	0
	4200	4635	0	1090	100	800
	10825					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	600
2007	450	0	0	0	0	0
2008	600	0	0	0	0	0
2009	0	0	0	545	0	0
2010	0	0	0	0	0	0
2011	0	0	0	545	0	0
2012	150	0	0	0	0	0
2013	600	0	0	545	0	0
2014	150	0	0	0	0	0
2015	300	0	0	0	0	0
2016	150	0	0	0	0	0
2017	300	0	0	0	0	0
2018	150	0	0	0	0	0
2019	0	0	0	545	0	0
2020	0	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	0	0	545	0	0
2023	0	0	0	0	200	0
2024	0	0	0	545	0	0
2025	0	0	0	545	100	200
2026	150	0	0	0	100	0
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	0
2031	450	0	0	545	0	0
	4200	0	0	5450	400	800
	10850					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	600
2007	300	0	0	0	0	0
2008	600	0	0	0	0	0
2009	0	0	0	545	0	0
2010	0	0	0	0	0	200
2011	0	515	0	0	0	0
2012	150	0	0	0	0	0
2013	600	515	0	0	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	0	515	0	0	0	0
2018	0	0	0	0	0	0
2019	300	0	0	0	0	0
2020	150	0	0	0	0	0
2021	300	0	0	0	0	0
2022	0	515	0	0	0	0
2023	150	0	0	0	0	0
2024	0	515	0	0	0	0
2025	150	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	515	0	0	0	0
	4050	4635	0	1090	0	800
	10575					

Cost through Extension Period

BASE = \$ 20,037.9 million

Cost vs. PTF without IGCC (d)

\$ 1,771.3  
8.84%

Cost vs. PTF without IGCC (d)

\$ (216.7)  
-1.08%

# 11- Wind Capacity Value 20%

**PTF Base Case: 11a Wind Cap Cr 20% Nameplate**

**Gas Only Case: 11b Wind Cap Cr 20% Nameplate**

**EGEAS Optimized Case: 11c Wind Cap Cr 20% Nameplate**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	0	500	0	0	0
2012	300	0	0	0	0	0
2013	450	0	0	545	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	150	0	0	0	0	200
2030	0	515	0	0	0	0
2031	150	515	0	0	0	400
	3600	4120	500	1635	0	600
	10455					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	0	0	0	1090	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	300	0	0	0	0	0
2018	150	0	0	0	0	200
2019	150	0	0	0	100	0
2020	150	0	0	0	100	0
2021	0	0	0	0	200	0
2022	0	0	0	545	0	0
2023	300	0	0	0	0	0
2024	150	0	0	0	0	200
2025	300	0	0	545	0	200
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	300	0	0	0	0	0
2030	0	0	0	545	0	0
2031	0	0	0	545	0	200
	3900	0	0	5450	400	800
	10550					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	600	0	0	0	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	515	0	0	0	0
2012	150	0	0	0	0	0
2013	600	0	0	545	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	0	515	0	0	0	0
2019	0	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	150	0	0	0	0	200
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	0
2031	150	515	0	0	100	600
	3900	4120	0	1635	100	800
	10555					

Cost through Extension Period

BASE = \$ 20,408.9 million

Cost vs. PTF Base (a)

\$ 1,556.9  
7.63%

Cost vs. PTF Base (a)

\$ (292.4)  
-1.43%

**PTF without IGCC: 11d, Wind Cap Cr 20% Nameplate**

**Gas Only Case: 11b Wind Cap Cr 20% Nameplate**

**EGEAS Optimized Case: 11c Wind Cap Cr 20% Nameplate**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	600	0	0	545	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	0	515	0	0	0	0
2019	0	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	150	0	0	0	0	200
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	0
2031	150	515	0	0	100	600
	3900	4120	0	1635	100	800
	10555					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	0	0	0	1090	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	300	0	0	0	0	0
2018	150	0	0	0	0	200
2019	150	0	0	0	100	0
2020	150	0	0	0	100	0
2021	0	0	0	0	200	0
2022	0	0	0	545	0	0
2023	300	0	0	0	0	0
2024	150	0	0	0	0	200
2025	300	0	0	545	0	200
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	300	0	0	0	0	0
2030	0	0	0	545	0	0
2031	0	0	0	545	0	200
	3900	0	0	5450	400	800
	10550					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	600	0	0	0	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	515	0	0	0	0
2012	150	0	0	0	0	0
2013	600	0	0	545	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	0	515	0	0	0	0
2019	0	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	150	0	0	0	0	200
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	0
2031	150	515	0	0	100	600
	3900	4120	0	1635	100	800
	10555					

Cost through Extension Period

BASE = \$ 20,162.0 million

Cost vs. PTF without IGCC (d)

\$ 1,803.8  
8.95%

Cost vs. PTF without IGCC (d)

\$ (45.5)  
-0.23%

## 12-ERGS Unit 1 2008

**PTF Base Case: 12a ERGS Unit 1 2008**

**Gas Only Case: 1b Gas Only**

**EGEAS Optimized Case: 12c ERGS Unit 1 2008**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	515	0	0	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	0	500	0	0	0
2012	300	0	0	0	0	0
2013	450	0	0	545	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	515	0	0	0	600
	3750	4120	500	1635	0	600
	10605					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	0	0	0	1090	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	300	0	0	0	0	0
2018	0	0	0	545	0	0
2019	0	0	0	0	0	0
2020	150	0	0	0	0	0
2021	0	0	0	0	200	0
2022	0	0	0	545	0	0
2023	0	0	0	0	200	0
2024	300	0	0	0	0	0
2025	450	0	0	545	0	0
2026	150	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	200
2031	450	0	0	545	0	600
	4200	0	0	5450	400	800
	10850					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	600	0	0	0	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	515	0	0	0	0
2012	150	0	0	0	0	0
2013	600	0	0	545	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	0	515	0	0	0	0
2019	0	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	200
2031	150	515	0	0	100	600
	4050	4120	0	1635	100	800
	10705					

Cost through Extension Period

BASE = \$ 20,415.3 million

Cost vs. PTF Base (a)

\$ 1,596.6  
7.82%

Cost vs. PTF Base (a)

\$ (274.1)  
-1.34%

**PTF without IGCC: 12d, ERGS Unit 1 2008**

**Gas Only Case: 1b Gas Only**

**EGEAS Optimized Case: 12c ERGS Unit 1 2008**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	515	0	0	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	600	0	0	545	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	0	515	0	0	0	0
2019	0	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	200
2031	150	515	0	0	100	600
	4050	4120	0	1635	100	800
	10705					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	0	0	0	1090	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	300	0	0	0	0	0
2018	0	0	0	545	0	0
2019	0	0	0	0	0	0
2020	150	0	0	0	0	0
2021	0	0	0	0	200	0
2022	0	0	0	545	0	0
2023	0	0	0	0	200	0
2024	300	0	0	0	0	0
2025	450	0	0	545	0	0
2026	150	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	200
2031	450	0	0	545	0	600
	4200	0	0	5450	400	800
	10850					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	600	0	0	0	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	515	0	0	0	0
2012	150	0	0	0	0	0
2013	600	0	0	545	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	0	515	0	0	0	0
2019	0	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	200
2031	150	515	0	0	100	600
	4050	4120	0	1635	100	800
	10705					

Cost through Extension Period

BASE = \$ 20,170.7 million

Cost vs. PTF without IGCC (d)

\$ 1,841.2  
9.13%

Cost vs. PTF without IGCC (d)

\$ (29.5)  
-0.15%

### 13-615 to We Energies

**PTF Case: 13a All 615 to We Energies**

**Gas Only Case: 1b**

**EGEAS Optimized Case: 9c All 615 to We Energies**

Pkr	Coal	IGCC	CC	Biomass	Wind
150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0
2004	0	0	0	0	0
2005	0	0	545	0	0
2006	0	0	0	0	0
2007	0	615	0	0	0
2008	0	0	545	0	0
2009	0	615	0	0	0
2010	0	0	0	0	0
2011	0	0	600	0	0
2012	0	0	0	0	0
2013	450	0	545	0	0
2014	300	0	0	0	0
2015	150	0	0	0	0
2016	300	0	0	0	0
2017	150	0	0	0	0
2018	300	0	0	0	0
2019	150	0	0	0	0
2020	300	0	0	0	0
2021	150	0	0	0	0
2022	0	615	0	0	0
2023	150	0	0	0	0
2024	300	0	0	0	0
2025	300	615	0	0	0
2026	300	0	0	0	0
2027	0	0	0	0	0
2028	0	615	0	0	0
2029	150	0	0	0	0
2030	300	0	0	0	0
2031	150	615	0	100	600
3900					
10525					

Pkr	Coal	IGCC	CC	Biomass	Wind
150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0
2004	0	0	0	0	0
2005	0	0	545	0	0
2006	0	0	0	0	0
2007	0	0	545	0	0
2008	0	0	545	0	0
2009	450	0	0	0	0
2010	0	0	0	0	0
2011	450	0	0	0	0
2012	300	0	0	0	0
2013	0	0	1090	0	0
2014	300	0	0	0	0
2015	150	0	0	0	0
2016	150	0	0	0	0
2017	300	0	0	0	0
2018	0	0	545	0	0
2019	0	0	0	0	0
2020	150	0	0	0	0
2021	0	0	0	200	0
2022	0	0	545	0	0
2023	0	0	0	200	0
2024	300	0	0	0	0
2025	450	0	545	0	0
2026	150	0	0	0	0
2027	0	0	0	0	0
2028	0	0	545	0	0
2029	300	0	0	0	0
2030	300	0	0	200	0
2031	450	0	545	0	600
4200					
10850					

Pkr	Coal	IGCC	CC	Biomass	Wind
150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0
2004	0	0	0	0	0
2005	0	0	0	545	0
2006	0	0	0	0	0
2007	0	0	0	545	0
2008	0	0	0	545	0
2009	450	0	0	0	0
2010	0	0	0	0	0
2011	0	615	0	0	0
2012	150	0	0	0	0
2013	450	615	0	0	0
2014	300	0	0	0	0
2015	150	0	0	0	0
2016	300	0	0	0	0
2017	150	0	0	0	0
2018	0	615	0	0	0
2019	0	0	0	0	0
2020	150	0	0	0	0
2021	150	0	0	0	0
2022	0	615	0	0	0
2023	150	0	0	0	0
2024	300	0	0	0	0
2025	300	615	0	0	0
2026	300	0	0	0	0
2027	0	0	0	0	0
2028	0	615	0	0	0
2029	150	0	0	0	0
2030	300	0	0	0	0
2031	150	615	0	100	400
3900					
10340					

Cost through Extension Period

**BASE = \$ 20,596.8 million**

Cost vs. PTF Base (a)

**\$ 1,415.1**  
6.87%

Cost vs. PTF Base (a)

**\$ (436.0)**  
-2.12%

**PTF without IGCC: 13d, All 615 to We Energies**

**Gas Only Case: 1b**

**EGEAS Optimized Case: 9c All 615 to We Energies**

Pkr	Coal	IGCC	CC	Biomass	Wind
150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0
2004	0	0	0	0	0
2005	0	0	545	0	0
2006	0	0	0	0	0
2007	0	615	0	0	0
2008	0	0	545	0	0
2009	0	615	0	0	0
2010	0	0	0	0	0
2011	150	0	0	0	0
2012	450	0	0	0	0
2013	450	0	545	0	0
2014	300	0	0	0	0
2015	150	0	0	0	0
2016	300	0	0	0	0
2017	150	0	0	0	0
2018	0	615	0	0	0
2019	0	0	0	0	0
2020	150	0	0	0	0
2021	150	0	0	0	0
2022	0	615	0	0	0
2023	150	0	0	0	0
2024	300	0	0	0	0
2025	300	615	0	0	0
2026	300	0	0	0	0
2027	0	0	0	0	0
2028	0	615	0	0	0
2029	150	0	0	0	0
2030	300	0	0	0	0
2031	150	615	0	100	400
3900					
10340					

Pkr	Coal	IGCC	CC	Biomass	Wind
150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0
2004	0	0	0	0	0
2005	0	0	545	0	0
2006	0	0	0	0	0
2007	0	0	545	0	0
2008	0	0	545	0	0
2009	450	0	0	0	0
2010	0	0	0	0	0
2011	450	0	0	0	0
2012	300	0	0	0	0
2013	0	0	1090	0	0
2014	300	0	0	0	0
2015	150	0	0	0	0
2016	150	0	0	0	0
2017	300	0	0	0	0
2018	0	0	545	0	0
2019	0	0	0	0	0
2020	150	0	0	0	0
2021	0	0	0	200	0
2022	0	0	545	0	0
2023	0	0	0	200	0
2024	300	0	0	0	0
2025	450	0	545	0	0
2026	150	0	0	0	0
2027	0	0	0	0	0
2028	0	0	545	0	0
2029	300	0	0	0	0
2030	300	0	0	200	0
2031	450	0	545	0	600
4200					
10850					

Pkr	Coal	IGCC	CC	Biomass	Wind
150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0
2004	0	0	0	0	0
2005	0	0	0	545	0
2006	0	0	0	0	0
2007	0	0	0	545	0
2008	0	0	0	545	0
2009	450	0	0	0	0
2010	0	0	0	0	0
2011	0	615	0	0	0
2012	150	0	0	0	0
2013	450	615	0	0	0
2014	300	0	0	0	0
2015	150	0	0	0	0
2016	300	0	0	0	0
2017	150	0	0	0	0
2018	0	615	0	0	0
2019	0	0	0	0	0
2020	150	0	0	0	0
2021	150	0	0	0	0
2022	0	615	0	0	0
2023	150	0	0	0	0
2024	300	0	0	0	0
2025	300	615	0	0	0
2026	300	0	0	0	0
2027	0	0	0	0	0
2028	0	615	0	0	0
2029	150	0	0	0	0
2030	300	0	0	0	0
2031	150	615	0	100	400
3900					
10340					

Cost through Extension Period

**BASE = \$ 20,266.1 million**

Cost vs. PTF without IGCC (d)

**\$ 1,745.8**  
8.61%

Cost vs. PTF without IGCC (d)

**\$ (105.3)**  
-0.52%

# 14-Lease Extended

**PTF Base Case: 14a Lease Extension**

**Gas Only Case: 1b**

**EGEAS Optimized Case: 14c Lease Extension**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	0	500	0	0	0
2012	300	0	0	0	0	0
2013	450	0	0	545	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	0	515	0	0	0	0
2019	0	0	0	0	0	0
2020	150	0	0	0	0	0
2021	300	0	0	0	0	0
2022	0	515	0	0	0	0
2023	300	0	0	0	0	0
2024	150	0	0	0	0	0
2025	0	1030	0	0	0	0
2026	150	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	515	0	0	0	0
	3150	4635	500	1635	0	0
	9920					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	0	0	0	545	0	0
2012	300	0	0	0	0	0
2013	450	0	0	545	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	0	0	0	545	0	0
2018	0	0	0	0	0	0
2019	300	0	0	0	0	0
2020	150	0	0	0	0	0
2021	0	0	0	0	200	0
2022	0	0	0	545	0	0
2023	0	0	0	0	200	0
2024	300	0	0	0	0	0
2025	450	0	0	545	0	0
2026	150	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	200
2031	450	0	0	545	0	600
	4200	0	0	5450	400	800
	10850					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	515	0	0	0	0
2012	150	0	0	0	0	0
2013	600	515	0	0	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	300	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	0	515	0	0	0	0
2021	0	0	0	0	0	0
2022	0	515	0	0	0	0
2023	150	0	0	0	0	0
2024	300	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	515	0	0	0	600
	3750	4635	0	1635	0	600
	10620					

Cost through Extension Period

BASE = \$ 19,861.2 million

Cost vs. PTF Base a

\$ 1,776.5  
8.94%

Cost vs. PTF Base a

\$ (231.9)  
-1.17%

**PTF without IGCC: 14d, Lease Extension**

**Gas Only Case: 1b**

**EGEAS Optimized Case: 14c Lease Extension**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	600	515	0	0	0	0
2014	150	0	0	0	0	0
2015	300	0	0	0	0	0
2016	150	0	0	0	0	0
2017	0	515	0	0	0	0
2018	0	0	0	0	0	0
2019	150	0	0	0	0	0
2020	300	0	0	0	0	0
2021	300	0	0	0	0	0
2022	0	515	0	0	0	0
2023	150	0	0	0	0	0
2024	0	515	0	0	0	0
2025	150	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	450	0	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	515	0	0	0	800
	4200	4635	0	1090	0	800
	10725					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	0	0	0	545	0	0
2012	300	0	0	0	0	0
2013	450	0	0	545	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	0	0	0	545	0	0
2018	0	0	0	0	0	0
2019	300	0	0	0	0	0
2020	150	0	0	0	0	0
2021	0	0	0	0	200	0
2022	0	0	0	545	0	0
2023	0	0	0	0	200	0
2024	300	0	0	0	0	0
2025	450	0	0	545	0	0
2026	150	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	200
2031	450	0	0	545	0	600
	4200	0	0	5450	400	800
	10850					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	515	0	0	0	0
2012	150	0	0	0	0	0
2013	600	515	0	0	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	300	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	0	515	0	0	0	0
2021	0	0	0	0	0	0
2022	0	515	0	0	0	0
2023	150	0	0	0	0	0
2024	300	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	515	0	0	0	600
	3750	4635	0	1635	0	600
	10620					

Cost through Extension Period

BASE = \$ 19,659.0 million

Cost vs. PTF without IGCC (d)

\$ 1,978.7  
10.07%

Cost vs. PTF without IGCC (d)

\$ (29.7)  
-0.15%

# 15- SCPC Low Cost

**PTF Base Case: 15a SCPC Low Cost**

**Gas Only Case: 1b**

**EGEAS Optimized Case:15cSCPC Low Cost**

Pkr	Coal	IGCC	CC	Biomass	Wind
150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0
2004	0	0	0	0	0
2005	0	0	545	0	0
2006	0	0	0	0	0
2007	0	515	0	0	0
2008	0	0	545	0	0
2009	0	515	0	0	0
2010	0	0	0	0	0
2011	0	0	500	0	0
2012	300	0	0	0	0
2013	450	0	0	545	0
2014	300	0	0	0	0
2015	150	0	0	0	0
2016	300	0	0	0	0
2017	150	0	0	0	0
2018	0	515	0	0	0
2019	0	0	0	0	0
2020	150	0	0	0	0
2021	300	0	0	0	0
2022	0	515	0	0	0
2023	300	0	0	0	0
2024	150	0	0	0	0
2025	0	1030	0	0	0
2026	150	0	0	0	0
2027	0	0	0	0	0
2028	0	515	0	0	0
2029	300	0	0	0	0
2030	0	515	0	0	0
2031	150	515	0	0	0
3150 4635 500 1635 0 0					
9920					

Pkr	Coal	IGCC	CC	Biomass	Wind
150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0
2004	0	0	0	0	0
2005	0	0	545	0	0
2006	0	0	0	0	0
2007	0	0	545	0	0
2008	0	0	545	0	0
2009	450	0	0	0	0
2010	0	0	0	0	0
2011	450	0	0	0	0
2012	300	0	0	0	0
2013	0	0	1090	0	0
2014	300	0	0	0	0
2015	150	0	0	0	0
2016	150	0	0	0	0
2017	300	0	0	0	0
2018	0	0	545	0	0
2019	0	0	0	0	0
2020	150	0	0	0	0
2021	0	0	0	200	0
2022	0	0	545	0	0
2023	0	0	0	200	0
2024	300	0	0	0	0
2025	450	0	545	0	0
2026	150	0	0	0	0
2027	0	0	0	0	0
2028	0	0	545	0	0
2029	300	0	0	0	0
2030	300	0	0	0	200
2031	450	0	545	0	600
4200 0 0 5450 400 800					
10850					

Pkr	Coal	IGCC	CC	Biomass	Wind
150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0
2004	0	0	0	0	0
2005	0	0	0	545	0
2006	0	0	0	0	0
2007	0	0	0	545	0
2008	600	0	0	0	0
2009	0	515	0	0	0
2010	0	0	0	0	0
2011	0	515	0	0	0
2012	150	0	0	0	0
2013	600	515	0	0	0
2014	150	0	0	0	0
2015	300	0	0	0	0
2016	150	0	0	0	0
2017	0	515	0	0	0
2018	0	0	0	0	0
2019	150	0	0	0	0
2020	300	0	0	0	0
2021	300	0	0	0	0
2022	0	515	0	0	0
2023	150	0	0	0	0
2024	0	515	0	0	0
2025	600	0	0	0	0
2026	300	0	0	0	0
2027	0	0	0	0	0
2028	0	515	0	0	0
2029	300	0	0	0	0
2030	0	515	0	0	0
2031	150	515	0	0	800
4200 4635 0 1090 0 800					
10725					

Cost through Extension Period

BASE = \$ 20,215.6 million

Cost vs. PTF Base (a)

\$ 1,796.3  
8.89%

Cost vs. PTF Base (a)

\$ (315.4)  
-1.56%

**PTF without IGCC: 15d, SCPC Low Cost**

**Gas Only Case: 1b**

**EGEAS Optimized Case:15cSCPC Low Cost**

Pkr	Coal	IGCC	CC	Biomass	Wind
150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0
2004	0	0	0	0	0
2005	0	0	545	0	0
2006	0	0	0	0	0
2007	0	515	0	0	0
2008	0	0	545	0	0
2009	0	515	0	0	0
2010	0	0	0	0	0
2011	450	0	0	0	0
2012	300	0	0	0	0
2013	600	515	0	0	0
2014	150	0	0	0	0
2015	300	0	0	0	0
2016	150	0	0	0	0
2017	0	515	0	0	0
2018	0	0	0	0	0
2019	150	0	0	0	0
2020	300	0	0	0	0
2021	300	0	0	0	0
2022	0	515	0	0	0
2023	150	0	0	0	0
2024	0	515	0	0	0
2025	600	0	0	0	0
2026	300	0	0	0	0
2027	0	0	0	0	0
2028	0	515	0	0	0
2029	300	0	0	0	0
2030	0	515	0	0	0
2031	150	515	0	0	800
4200 4635 0 1090 0 800					
10725					

Pkr	Coal	IGCC	CC	Biomass	Wind
150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0
2004	0	0	0	0	0
2005	0	0	545	0	0
2006	0	0	0	0	0
2007	0	0	545	0	0
2008	0	0	545	0	0
2009	450	0	0	0	0
2010	0	0	0	0	0
2011	450	0	0	0	0
2012	300	0	0	0	0
2013	0	0	1090	0	0
2014	300	0	0	0	0
2015	150	0	0	0	0
2016	150	0	0	0	0
2017	300	0	0	0	0
2018	0	0	545	0	0
2019	0	0	0	0	0
2020	150	0	0	0	0
2021	0	0	0	200	0
2022	0	0	545	0	0
2023	0	0	0	200	0
2024	300	0	0	0	0
2025	450	0	545	0	0
2026	150	0	0	0	0
2027	0	0	0	0	0
2028	0	0	545	0	0
2029	300	0	0	0	0
2030	300	0	0	0	200
2031	450	0	545	0	600
4200 0 0 5450 400 800					
10850					

Pkr	Coal	IGCC	CC	Biomass	Wind
150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0
2004	0	0	0	0	0
2005	0	0	0	545	0
2006	0	0	0	0	0
2007	0	0	0	545	0
2008	600	0	0	0	0
2009	0	515	0	0	0
2010	0	0	0	0	0
2011	0	515	0	0	0
2012	150	0	0	0	0
2013	600	515	0	0	0
2014	150	0	0	0	0
2015	300	0	0	0	0
2016	150	0	0	0	0
2017	0	515	0	0	0
2018	0	0	0	0	0
2019	150	0	0	0	0
2020	300	0	0	0	0
2021	300	0	0	0	0
2022	0	515	0	0	0
2023	150	0	0	0	0
2024	0	515	0	0	0
2025	600	0	0	0	0
2026	300	0	0	0	0
2027	0	0	0	0	0
2028	0	515	0	0	0
2029	300	0	0	0	0
2030	0	515	0	0	0
2031	150	515	0	0	800
4200 4635 0 1090 0 800					
10725					

Cost through Extension Period

BASE = \$ 19,930.8 million

Cost vs. PTF without IGCC (d)

\$ 2,081.1  
10.44%

Cost vs. PTF without IGCC (d)

\$ (30.6)  
-0.15%

# 16-SCPC High Cost

**PTF Base Case: 16a SCPC High Cost**

**Gas Only Case: 1b Gas Only**

**EGEAS Optimized Case: 16c SCPC High Cost**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	0	500	0	0	0
2012	300	0	0	0	0	0
2013	450	0	0	545	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	450	0	0	0	0	0
2029	300	0	0	0	200	0
2030	0	515	0	0	0	0
2031	150	515	0	0	600	0
	4200	3605	500	1635	0	800
	10740					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	0	0	0	1090	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	300	0	0	0	0	0
2018	0	0	0	545	0	0
2019	0	0	0	0	0	0
2020	150	0	0	0	0	0
2021	0	0	0	0	200	0
2022	0	0	0	545	0	0
2023	0	0	0	0	200	0
2024	300	0	0	0	0	0
2025	450	0	0	545	0	0
2026	150	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	200
2031	450	0	0	545	0	600
	4200	0	0	5450	400	800
	10850					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	0	515	0	0	0	0
2012	300	0	0	0	0	0
2013	600	515	0	0	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	0	515	0	0	0	0
2017	0	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	300	0	0	0	0	0
2024	300	0	0	0	0	200
2025	300	515	0	0	0	0
2026	150	0	0	0	100	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	515	0	0	0	600
	4050	4120	0	1635	100	800
	10705					

Cost through Extension Period

BASE = \$ 20,830.8 million

Cost vs. PTF Base (a)

\$ 1,181.1  
5.67%

Cost vs. PTF Base (a)

\$ (278.4)  
-1.34%

**PTF without IGCC: 16d, SCPC High Cost**

**Gas Only Case: 1b Gas Only**

**EGEAS Optimized Case: 16c SCPC High Cost**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	600	0	0	545	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	0	515	0	0	0	0
2019	0	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	300	0	0	0	0	0
2024	300	0	0	0	200	0
2025	300	515	0	0	0	0
2026	150	0	0	0	100	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	515	0	0	600	0
	4050	4120	0	1635	100	800
	10705					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	0	0	0	1090	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	300	0	0	0	0	0
2018	0	0	0	545	0	0
2019	0	0	0	0	0	0
2020	150	0	0	0	0	0
2021	0	0	0	0	200	0
2022	0	0	0	545	0	0
2023	0	0	0	0	200	0
2024	300	0	0	0	0	0
2025	450	0	0	545	0	0
2026	150	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	200
2031	450	0	0	545	0	600
	4200	0	0	5450	400	800
	10850					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	0	515	0	0	0	0
2012	300	0	0	0	0	0
2013	600	515	0	0	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	0	515	0	0	0	0
2017	0	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	300	0	0	0	0	0
2024	300	0	0	0	0	200
2025	300	515	0	0	0	0
2026	150	0	0	0	100	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	515	0	0	0	600
	4050	4120	0	1635	100	800
	10705					

Cost through Extension Period

BASE = \$ 20,638.4 million

Cost vs. PTF without IGCC (d)

\$ 1,373.5  
6.66%

Cost vs. PTF without IGCC (d)

\$ (86.0)  
-0.42%

## 17-Coal Tax Credit

### PTF Case: 17a Coal Tax Credit

### Gas Only Case: 1b

### EGEAS Optimized Case: 17c Coal Tax Credit

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	0	500	0	0	0
2012	300	0	0	0	0	0
2013	450	0	0	545	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	515	0	0	0	600
	3750	4120	500	1635	0	600
	10605					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	0	0	0	1090	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	300	0	0	0	0	0
2018	0	0	0	545	0	0
2019	0	0	0	0	0	0
2020	150	0	0	0	0	0
2021	0	0	0	0	200	0
2022	0	0	0	545	0	0
2023	0	0	0	0	200	0
2024	300	0	0	0	0	0
2025	450	0	0	545	0	0
2026	150	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	200
2031	450	0	0	545	0	600
	4200	0	0	5450	400	800
	10850					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	515	0	0	0	0
2009	450	0	0	0	0	0
2010	150	0	0	0	0	0
2011	0	515	0	0	0	0
2012	150	0	0	0	0	0
2013	600	0	0	545	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	0	515	0	0	0	0
2019	0	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	200
2031	150	515	0	0	100	600
	4050	4120	0	1635	100	800
	10705					

#### Cost through Extension Period

BASE = \$ 20,328.3 million

#### Cost vs. PTF Base (a)

\$ 1,683.6  
8.28%

#### Cost vs. PTF Base (a)

\$ (274.3)  
-1.35%

### PTF without IGCC: 17d, Coal Tax Credit

### Gas Only Case: 1b

### EGEAS Optimized Case: 17c Coal Tax Credit

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	600	0	0	545	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	0	515	0	0	0	0
2019	0	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	200
2031	150	515	0	0	100	600
	4050	4120	0	1635	100	800
	10705					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	0	0	0	1090	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	300	0	0	0	0	0
2018	0	0	0	545	0	0
2019	0	0	0	0	0	0
2020	150	0	0	0	0	0
2021	0	0	0	0	200	0
2022	0	0	0	545	0	0
2023	0	0	0	0	200	0
2024	300	0	0	0	0	0
2025	450	0	0	545	0	0
2026	150	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	200
2031	450	0	0	545	0	600
	4200	0	0	5450	400	800
	10850					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	515	0	0	0	0
2009	450	0	0	0	0	0
2010	150	0	0	0	0	0
2011	0	515	0	0	0	0
2012	150	0	0	0	0	0
2013	600	0	0	545	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	0	515	0	0	0	0
2019	0	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	200
2031	150	515	0	0	100	600
	4050	4120	0	1635	100	800
	10705					

#### Cost through Extension Period

BASE = \$ 20,084.3 million

#### Cost vs. PTF without IGCC (d)

\$ 1,927.6  
9.60%

#### Cost vs. PTF without IGCC (d)

\$ (30.3)  
-0.15%

18-CO2-#-2010

PTF Base Case: 18a CO2 \$3 Metric Ton in 2010

Gas Only Case: 18b CO2 \$3 Metric Ton in 2010

EGEAS Optimized Case: 18c CO2 \$3 Metric Ton in 2010

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	0	500	0	0	0
2012	300	0	0	0	0	0
2013	450	0	0	545	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	150	0	0	0	100	400
2031	150	515	0	0	200	200
	3900	3605	500	1635	300	600
	10540					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	0	0	0	1090	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	150	0	0	0	100	0
2018	150	0	0	0	100	0
2019	0	0	0	545	0	0
2020	0	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	0	0	545	0	0
2023	0	0	0	0	200	0
2024	300	0	0	0	0	0
2025	450	0	0	545	0	0
2026	150	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	400
2031	450	0	0	545	0	400
	4200	0	0	5450	400	800
	10850					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	0	515	0	0	0	0
2012	300	0	0	0	0	0
2013	600	515	0	0	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	0	515	0	0	0	0
2019	0	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	300	0	0	0	100	200
2029	300	0	0	0	0	200
2030	0	515	0	0	0	0
2031	150	515	0	0	0	400
	4050	4120	0	1635	100	800
	10705					

Cost through Extension Period

BASE = \$ 21,607.3 million

Cost vs. PTF Base a

\$ 1,279.6  
5.92%

Cost vs. PTF Base a

\$ (294.8)  
-1.36%

PTF without IGCC: 18d, CO2 \$3 Metric Ton in 2010

Gas Only Case: 18b CO2 \$3 Metric Ton in 2010

EGEAS Optimized Case: 18c CO2 \$3 Metric Ton in 2010

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	0	0	0	545	0	0
2009	0	515	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	600	0	0	545	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	0	515	0	0	0	0
2019	0	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	300	0	0	0	100	200
2029	300	0	0	0	0	200
2030	0	515	0	0	0	0
2031	150	515	0	0	0	400
	4050	4120	0	1635	100	800
	10705					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	0	0	0	1090	0	0
2014	300	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	150	0	0	0	100	0
2018	150	0	0	0	100	0
2019	0	0	0	545	0	0
2020	0	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	0	0	545	0	0
2023	0	0	0	0	200	0
2024	300	0	0	0	0	0
2025	450	0	0	545	0	0
2026	150	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	400
2031	450	0	0	545	0	400
	4200	0	0	5450	400	800
	10850					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	450	0	0	0	0	0
2010	0	0	0	0	0	0
2011	0	515	0	0	0	0
2012	300	0	0	0	0	0
2013	600	515	0	0	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	0	515	0	0	0	0
2019	0	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	300	0	0	0	100	200
2029	300	0	0	0	0	200
2030	0	515	0	0	0	0
2031	150	515	0	0	0	400
	4050	4120	0	1635	100	800
	10705					

Cost through Extension Period

BASE = \$ 21,361.1 million

Cost vs. PTF without IGCC (d)

\$ 1,525.8  
7.14%

Cost vs. PTF without IGCC (d)

\$ (48.6)  
-0.23%

# 19- EPA Settlement 2008

**PTF Base Case: 19a EPA Retirement 2008**

**Gas Only Case: 19b EPA Retire in 2008**

**EGEAS Optimized Case: 19c EPA Retire in 2008**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	150	0	0	545	0	0
2009	600	515	0	0	0	0
2010	0	0	0	0	0	0
2011	0	0	500	0	0	0
2012	150	0	0	0	0	0
2013	450	0	0	0	0	0
2014	150	0	0	0	0	0
2015	0	515	0	0	0	0
2016	0	0	0	0	0	0
2017	150	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	300	0	0	0	0	0
2021	300	0	0	0	0	0
2022	0	515	0	0	0	0
2023	150	0	0	0	0	0
2024	300	0	0	0	200	0
2025	450	515	0	0	0	0
2026	150	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	515	0	0	400	0
	4200	4120	500	1090	0	600
	10510					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	600	0	0	545	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	0	0	0	545	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	300	0	0	0	0	0
2018	0	0	0	545	0	0
2019	0	0	0	0	0	0
2020	150	0	0	0	0	0
2021	0	0	0	0	200	0
2022	0	0	0	545	0	0
2023	0	0	0	0	200	0
2024	300	0	0	0	0	0
2025	450	0	0	545	0	0
2026	150	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	300	0	0	0	0	0
2030	0	0	0	0	0	200
2031	450	0	0	545	0	600
	4200	0	0	5450	400	800
	10850					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	600	515	0	0	0	0
2010	150	0	0	0	0	0
2011	0	515	0	0	0	0
2012	150	0	0	0	0	0
2013	450	0	0	0	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	0	515	0	0	0	0
2017	0	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	515	0	0	0	600
	3750	4635	0	1635	0	600
	10620					

Cost through Extension Period

BASE = \$ 20,706.6 million

Cost vs. PTF Base (a)

\$ 1,634.9  
7.90%

Cost vs. PTF Base (a)

\$ (245.9)  
-1.19%

**PTF without IGCC: 19d, EPA Retire in 2008**

**Gas Only Case: 19b EPA Retire in 2008**

**EGEAS Optimized Case: 19c EPA Retire in 2008**

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	515	0	0	0	0
2008	150	0	0	545	0	0
2009	600	515	0	0	0	0
2010	0	0	0	0	0	0
2011	300	0	0	0	0	0
2012	0	0	0	545	0	0
2013	300	0	0	0	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	300	0	0	0	0	0
2017	150	0	0	0	0	0
2018	0	515	0	0	0	0
2019	0	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	200	0
2031	150	515	0	0	100	600
	4050	4120	0	1635	100	800
	10705					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	600	0	0	545	0	0
2010	0	0	0	0	0	0
2011	450	0	0	0	0	0
2012	300	0	0	0	0	0
2013	0	0	0	545	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	150	0	0	0	0	0
2017	300	0	0	0	0	0
2018	0	0	0	545	0	0
2019	0	0	0	0	0	0
2020	150	0	0	0	0	0
2021	0	0	0	0	200	0
2022	0	0	0	545	0	0
2023	0	0	0	0	200	0
2024	300	0	0	0	0	0
2025	450	0	0	545	0	0
2026	150	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	0	0	545	0	0
2029	300	0	0	0	0	0
2030	300	0	0	0	0	200
2031	450	0	0	545	0	600
	4200	0	0	5450	400	800
	10850					

	Pkr	Coal	IGCC	CC	Biomass	Wind
	150 MW	520 MW	500 MW	545 MW	100 MW	200 MW
2003	0	0	0	0	0	0
2004	0	0	0	0	0	0
2005	0	0	0	545	0	0
2006	0	0	0	0	0	0
2007	0	0	0	545	0	0
2008	0	0	0	545	0	0
2009	600	515	0	0	0	0
2010	150	0	0	0	0	0
2011	0	515	0	0	0	0
2012	150	0	0	0	0	0
2013	450	0	0	0	0	0
2014	150	0	0	0	0	0
2015	150	0	0	0	0	0
2016	0	515	0	0	0	0
2017	0	0	0	0	0	0
2018	300	0	0	0	0	0
2019	150	0	0	0	0	0
2020	300	0	0	0	0	0
2021	150	0	0	0	0	0
2022	0	515	0	0	0	0
2023	0	515	0	0	0	0
2024	0	0	0	0	0	0
2025	450	515	0	0	0	0
2026	300	0	0	0	0	0
2027	0	0	0	0	0	0
2028	0	515	0	0	0	0
2029	300	0	0	0	0	0
2030	0	515	0	0	0	0
2031	150	515	0	0	0	600
	3750	4635	0	1635	0	600
	10620					

Cost through Extension Period

BASE = \$ 20,477.1 million

Cost vs. PTF without IGCC (d)

\$ 1,864.4  
9.10%

Cost vs. PTF without IGCC (d)

\$ (16.4)  
-0.08%

**Table 1 - 10**  
**Summary of Sensitivities Compared to Each Scenario's Base Case**

\$ in millions

Sensitivity	Description	a PTF	b Gas Only	c EGEAS Optimized	d PTF without IGCC
1	Base Case:	\$20,431.4	\$22,011.9	\$20,154.7	\$20,186.8
<u>Difference from Scenario Base Case (e.g., diff = 3d - 1d):</u>					
2	Low Load Forecast:	\$480.4	-\$2,689.9	-\$2,199.0	-\$2,103.2
3	High Load Forecast:	\$2,408.6	\$2,949.7	\$2,408.2	\$2,420.0
4	Low Natural Gas Prices:	-\$346.4	\$361.5	-\$409.8	-\$375.0
5	High Natural Gas Prices:	\$173.9	\$939.6	\$187.2	\$177.0
6	Highest Natural Gas Prices:	\$678.3	\$4,905.8	\$740.4	\$702.6
7	High Coal Prices:	\$234.5	\$154.1	\$238.7	\$239.9
8	Low Coal Prices:	-\$245.0	-\$81.6	-\$239.7	-\$239.9
9	Point Beach Retirement:	\$2,055.4	\$2,765.8	\$2,088.9	\$2,102.4
10	Extended Renewable PTC:	-\$130.3	-\$202.7	-\$333.5	-\$148.9
11	20% Wind Capacity Value:	-\$22.5	-\$46.1	-\$38.2	-\$24.8
12	ERGS Unit 1 Moved to 2008:	-\$16.1	\$0.0	-\$13.5	-\$16.1
13	MG&E and WPPI Decline Options:	\$165.4	\$0.0	\$6.1	\$79.3
14	Lease Extension:	-\$570.2	-\$374.2	-\$525.4	-\$527.8
15	SCPC Low Construction Cost:	-\$215.8	\$0.0	-\$254.5	-\$256.0
16	SCPC High Construction Cost:	\$399.4	\$0.0	\$397.7	\$451.6
17	Efficient Coal Tax Credit:	-\$103.1	\$0.0	-\$100.7	-\$102.5
18	Carbon Tax:	\$1,175.9	\$875.0	\$1,157.8	\$1,174.3
19	EPA Settlement in 2008:	\$275.2	\$329.6	\$306.0	\$290.3

Example:

For the High Load Sensitivity (# 3), the PTF without IGCC plan (3d) has a NPV of \$22,606.8 and the Base PTF without IGCC plan (1d) has a NPV of \$20,186.8. The difference is \$2,420.0, as shown in row 3, column d.

**Table 1 - 11**

**Summary of Sensitivities Compared to EGEAS Optimized for Each Sensitivity**

\$ in millions

Sensitivity	Description	a PTF	b Gas Only EGEAS Optimized	c PTF without IGCC	d	
1	Base Case:	\$20,431.4	\$22,011.9	\$20,154.7	\$20,186.8	
	Diff from EGEAS Optimized Base Case	\$276.7	\$1,857.2		\$32.1	
<u>Difference from EGEAS Optimized for each Sensitivity (e.g., diff = 3d - 3c):</u>						<u>within \$50M?</u>
2	Low Load Forecast:	\$2,956.1	\$1,416.3		\$127.9	
3	High Load Forecast:	\$277.1	\$2,398.7		\$43.9	Yes
4	Low Natural Gas Prices:	\$340.1	\$2,638.5		\$66.9	
5	High Natural Gas Prices:	\$263.4	\$2,609.6		\$21.9	Yes
6	Highest Natural Gas Prices:	\$214.6	\$6,022.6		-\$5.7	Yes
7	High Coal Prices:	\$281.5	\$1,772.6		\$33.3	Yes
8	Low Coal Prices:	\$271.4	\$2,015.3		\$31.9	Yes
9	Point Beach Retirement:	\$253.2	\$2,534.1		\$45.6	Yes
10	Extended Renewable PTC:	\$479.9	\$1,988.0		\$216.7	
11	20% Wind Capacity Value:	\$292.4	\$1,849.3		\$45.5	Yes
12	ERGS Unit 1 Moved to 2008:	\$274.1	\$1,870.7		\$29.5	Yes
13	MG&E and WPPI Decline Options:	\$436.0	\$1,851.9		\$105.3	
14	Lease Extension:	\$231.9	\$2,008.4		\$29.7	Yes
15	SCPC Low Construction Cost:	\$315.4	\$2,111.7		\$30.6	Yes
16	SCPC High Construction Cost:	\$278.4	\$1,459.5		\$86.0	
17	Efficient Coal Tax Credit:	\$274.3	\$1,957.9		\$30.3	Yes
18	Carbon Tax:	\$294.8	\$1,574.4		\$48.6	Yes
19	EPA Settlement in 2008:	\$245.9	\$1,880.8		\$16.4	Yes

Example:

For the High Load Sensitivity (# 3), the PTF without IGCC plan (3d) has a NPV of \$22,606.8 and the EGEAS Optimized plan (3c) has a NPV of \$22,562.9. The difference is \$43.9, as shown in row 3, column d.