California Environmental Protection Agency
AIR RESOURCES BOARD

STAFF REPORT: INITIAL STATEMENT OF REASONS FOR PROPOSED AMENDMENTS TO THE DISTRIBUTED GENERATION CERTIFICATION REGULATION

Stationary Source Division
Project Assessment Branch

September 1, 2006

State of California
AIR RESOURCES BOARD

STAFF REPORT: INITIAL STATEMENT OF REASONS FOR PROPOSED RULEMAKING

Public Hearing to Consider

Proposed Amendments to the
Distributed Generation Certification Regulation

To be considered by the Air Resources Board on October 19, 2006, at:

California Environmental Protection Agency
Headquarters Building
1001 I Street
Byron Sher Auditorium
Sacramento, California

STATIONARY SOURCE DIVISION

Robert Fletcher, Chief
Robert D. Barham, Assistant Chief
Michael J. Tollstrup, Chief, Project Assessment Branch
Michael Waugh, Manager, Program Assistance Section

State of California
AIR RESOURCES BOARD

PROPOSED AMENDMENTS TO THE DISTRIBUTED GENERATION CERTIFICATION REGULATION

Primary Authors

David Mehl
Marcelle Surovik

Contributing Authors

Raymond Asregadoo
Grant Chin
Kelly Weatherford

Legal Counsel

George Poppic, Office of Legal Affairs

Acknowledgements

This report was prepared with the assistance and support form the other divisions and offices of the Air Resources Board. In addition, we would like to acknowledge the assistance and cooperation that we have received from many individuals and organizations.

Staff Report: Initial Statement of Reasons for the Proposed Amendments to the Distributed Generation Certification Regulation

TABLE OF CONTENTS

Section Page

Executive Summary……......i

I. Introduction 1

II. Overview of Certified Distributed Generation Technology.....4

III. Summary of Proposed Amendments to the Distributed Generation Certification Regulation 7

IV. Environmental Impacts of Proposed Amendments 16

V. Economic Impacts of Proposed Amendments.....18

VI. References.....24

Appendices

Appendix A: Proposed Amendments to the Distributed Generation Certification Regulation

Appendix B: California Senate Bill 1298 (Bowen and Peace)

Appendix C: South Coast Air Quality Management District Method 25.3 (Determination of Low Concentration Non-methane Non-ethane Organic Compound Emissions from Clean Fueled Combustion Sources)

Appendix D: Waste Gas Source Test Data

EXECUTIVE SUMMARY

A. INTRODUCTION

This Executive Summary outlines the Air Resources Board (ARB or Board) staff's proposal to amend the Distributed Generation (DG) Certification regulation, which was approved by the Board on November 15, 2001.

This report comprises the Initial Statement of Reasons for the Proposed Amendments to the DG Certification regulation as required by the Administrative Procedures Act (Government Code 11340 et seq.). The Executive Summary of this report provides an overview of the proposed amendments to the DG Certification regulation, a summary of staff recommendations, and a brief discussion of the environmental and economic impacts resulting from the proposal. The body of the report provides a more detailed presentation of the technical aspects of the proposed amendments to the DG Certification regulation.

B. BACKGROUND

Distributed generation refers to replacing or supplementing electricity from the grid with electrical generation sources that are located near the place of use. Some examples of electrical generation technologies are engines, turbines, fuel cells, and photovoltaic cells. Some businesses choose to operate distributed generation technologies with heat recovery systems that capture the heat produced from the electrical generation process. This captured heat can then be used to heat water, provide steam or space heating, or power a chiller at the facility. Distributed generation can be used at various types of businesses such as hospitals, schools, libraries, breweries, utilities, and laundries.

Senate Bill (SB) 1298 (chaptered in 2000) required the ARB to establish a distributed generation certification program for electrical generation technologies that are exempt from local air district permits. SB 1298 mandated that the ARB establish at least two levels of emission standards for affected DG technologies. The law required that the first set of standards be effective no later than January 1, 2003, and reflect the best performance achieved in practice by existing DG technologies that are exempt from district permits. The law also required that, by the earliest practicable date, the standards be made equivalent to the level determined by the ARB to be the best available control technology (BACT) for permitted central station power plants in California. The emission standards were to be expressed in pounds per megawatt hour (lb/MW-hr) to reflect the efficiencies of various electrical generation technologies.

Pursuant to SB 1298, the Board adopted a DG Certification regulation in 2001. The ARB staff proposed interim standards for 2003 and recommended that 2007

be considered the earliest practicable date for DG applications to meet central power plant emission standards. In addition to establishing emission standards, the DG Certification regulation included testing protocols, calculation procedures, and other specified requirements that manufacturers must satisfy to certify DG technologies.

Generally, microturbines up to 250 kilowatts (kW), engines less than 50 horsepower (hp), and fuel cells are exempt from district permits. Although small engines are exempt from district permits, most engines used in distributed generation applications are larger and therefore require district permits. Consequently, the regulation has so far only affected fuel cells and microturbines.

There are currently about 700 microturbines and fuel cells in California capable of producing more than 41 MW of electricity. Of the 700 units, only four percent are fuel cells. Roughly half of the 700 units are certified models using natural gas. Of the remaining, there are more than 100 units operating on natural gas that were purchased before the DG Certification program became effective in 2003. The final 200 units operate on waste-gas fuels and are permitted by the local air districts. Roughly 50 percent of the certified units using natural gas operate with a heat recovery system. This is not surprising. To be economically competitive with grid power, DG units using natural gas should have a significant demand for the waste heat generated for such processes as heating water or running an absorption chiller.

Microturbines and fuel cells were just entering the California market when the Board adopted the DG Certification regulation in 2001. Because of uncertainties at the time regarding the development and deployment of these DG technologies, the ARB staff included in the regulation a requirement to conduct a technology review within a few years to evaluate the status of the DG certification program and determine if revisions were warranted. Staff's proposed amendments are a result of that review process.

C. PUBLIC PROCESS

In developing any regulation, the public, local air districts, and affected industries play an important role in shaping the regulatory proposals. ARB staff has made extensive efforts to have an open process and provide ample opportunity for input by all parties.

A DG workgroup was formed to assist ARB staff with conducting the 2005 technology review and developing the amendments to the DG Certification regulation. The workgroup consisted of approximately thirty individuals representing manufacturers of DG technologies, environmental groups, the California Energy Commission, utility companies, local air districts, and other interested parties. The ARB staff held the first workgroup meeting on

June 2, 2004, in Sacramento, and convened workgroup meetings intermittently for two years while developing draft amendments to the DG Certification regulation. Staff presented draft proposed amendments at a public consultation meeting on July 6, 2006, to invite discussion and comment by stakeholders and the public.

The ARB staff has maintained a website to facilitate the dissemination of up-to-date information on the progress of the modifications to the DG Certification regulation. The website is located at *http://www.arb.ca.gov/energy/dg/dg.htm*. In addition, ARB staff also used an e-mail list serve to notify affected industries and other interested parties of the workgroup meetings, agendas, and information to be discussed at the meetings. Approximately 1,200 individuals from federal, state, and local government, environmental groups, and industry subscribe to the list serve.

Staff participated in numerous individual meetings and conference calls with affected industry and other stakeholders to discuss and resolve issues specific to the proposed amendments. Staff also held conference calls with source testing representatives and manufacturers to discuss specific testing issues.

Staff revised the proposed amendments to the DG Certification regulation in consideration of the comments received during the public process. Staff made every effort to consider all comments and recommendations received.

D. PURPOSE OF TECHNOLOGY REVIEW

The certification regulation required the ARB staff to conduct a technology review by July 2005 to evaluate if specific certification requirements should be modified. ARB staff committed to this review because at the time the regulation was adopted, the technologies that would be affected by the regulation had not yet entered or were just entering the California market. Very little information was available on these emerging technologies.

The technology review was to address the feasibility of the 2007 standards, the credit given for utilizing combined heat and power (CHP)• to meet these standards, emissions durability, and test methods and procedures. Evaluating these specific requirements was the basis of ARB staff's evaluation; however, ARB staff also evaluated other additions and changes to the regulation during the review. Based on staff's evaluation of data available today, no changes are being proposed to the compliance date for the 2007 limits or to the CHP credit a manufacturer can use to meet these limits. Staff has identified necessary

• Combined heat and power (CHP) refers to the total amount of useful energy obtained from the DG equipment. It is the sum of the electrical output of the unit plus the amount of waste heat utilized in a productive manner, such as heating water or providing heat to industrial processes. These combined energy outputs are used to calculate the total megawatt-hours produced, and are therefore used when determining the emissions in pounds per megawatt-hour.

changes to the emissions durability and testing requirements. The next section discusses these proposed changes along with other proposed modifications needed to improve the program.

E. SUMMARY OF THE PROPOSED AMENDMENTS TO THE DISTRIBUTED GENERATION CERTIFICATION REGULATION

1. Emissions Durability and Testing Requirements

The proposed amendments would require manufacturers, when preparing the application package, to identify key components of the DG unit that are most critical to ensuring compliance with the certified emission limits, such as fuel injectors, rotors, seals and bearings for a microturbine, and fuel cell stacks and catalysts for fuel cells. In addition, the manufacturer would be required to keep records relating to how often these components are replaced and submit the records to the ARB upon request. In this manner, ARB staff will be able to track durability of equipment in the field.

Staff is proposing a number of changes to the testing requirements and parameters to improve and clarify the testing requirements and better reflect actual in-the-field operations of affected technologies. The proposed amendments would require manufacturers to test at only 100 percent load versus the three-load testing that is currently required because staff has determined that certified DG technologies are generally operated at only full capacity in the field. VOC testing would now be conducted using South Coast Air Quality Management District test method 25.3 to more accurately measure emissions at the low concentrations expected from certified technologies. To reduce recordkeeping and testing requirements for the manufacturers, they would no longer be required to test each individual DG unit for NOx emissions prior to commercial use. For clarification purposes, manufacturers would now be required to use a specific method to calculate recoverable heat if a CHP credit is being used to meet a standard. And, finally, the generator output measured during the source test would be based on net power output, not the gross output of the unit, to more accurately represent the actual available power from the unit.

2. Addition of Waste Gas Emission Standards

The proposed amendments would add requirements to enable technologies fueled with waste gases (landfill, digester, and oil-field waste gases) to be certified under this program. The current regulation, although allowing for fuels other than natural gas to be used for certification, does not contain a practical method in which to accomplish this. The composition of waste fuels varies from site to site and season to season, which makes it challenging to issue statewide certifications on these variable fuels. Therefore, local air districts have had to issue permits to otherwise permit-exempt equipment. The ARB staff proposes to bring these waste-gas applications into the DG certification program where they

appropriately belong. Both the local air districts and the manufacturers support integrating waste gas applications into the certification program.

To certify these permit-exempt waste-gas applications, ARB staff has developed surrogate fuel compositions based on data submitted to the ARB for landfill gases, digester gases, and oil-field waste gases. Manufacturers would be required to use these surrogate gases for certification testing.

Staff is proposing two sets of waste gas standards, much like what is currently in the regulation. Staff is proposing 2008 interim waste-gas standards that are similar to the current 2003 limits. Unlike the 2003 standards, the waste-gas 2008 standards would not include a particulate matter (PM) standard nor would they include a separate, less stringent, set of limits for units integrated with CHP. A PM standard is not being proposed because the impurities in waste gas that would contribute to PM emissions will be removed prior to being used with DG units in the field. Staff is not proposing to include less stringent 2008 limits for units integrated with CHP because manufacturers would now only have to test at 100 percent power load, which should allow them to meet the more stringent limits.

The proposed 2013 waste-gas standards are identical to the current 2007 limits, except for the omission of a PM standard as described above. The 2013 standards reflect central station power plant emissions, as required in SB 1298. As with the 2007 standards, a manufacturer can use a CHP credit to meet the 2013 standards if the unit is integrated and sold with a heat recovery system and can achieve a minimum efficiency of 60 percent. The proposed waste-gas emission standards are presented in Table 1:

Table 1: Proposed Waste Gas Emission Standards

Pollutant	Emission Standard (lb/MW-hr)	
	On or after January 1, 2008	On or after January 1, 2013
NO_x	0.5	0.07
CO	6.0	0.10
VOCs	1.0	0.02

3. Other Amendments

The proposed amendments would eliminate the PM standard in the current 2007 emission standards, clarify that the current 2007 standards would apply to fossil fuels (e.g., natural gas and liquefied petroleum gas (LPG)) units, and add a definition for LPG.

The current 2007 PM emission standard is essentially the sulfur limit in Public Utility Commission (PUC) grade natural gas (one grain of sulfur per 100 standard

cubic feet). Staff is proposing to eliminate this PM standard for natural gas because it is redundant: "natural gas" is defined in the regulation as PUC-quality gas. Staff proposes to not include a PM standard for LPG, as it is not expected to have any measurable amount of PM emissions.

The proposed amendments would change the fee structure of the program to fully cover costs to the State to implement this program, as allowed by SB 1298. Initial certification application fees under the proposed amendments would increase $5,000 from $2,500 to $7,500. Staff had estimated $2,500 per application when the DG certification program was being developed in 2001, but subsequent experience with the program has shown that staff underestimated the number of hours required to review and process certification applications. The new fee reflects the estimated 60 hours of ARB staff time that is generally needed to process applications.

Manufacturers of technologies that can meet the 2013 standards by January 1, 2008 (such as fuel cells), would be exempt from submitting an initial fee. ARB staff is proposing no initial application fee for these technologies to provide an economic incentive for early introduction of the cleanest waste-gas-fueled DG technologies.

The current fee assessment for recertification is $2,500. The ARB staff proposes to maintain that fee for DG units that do not require a source test for recertification. Staff proposes to assess a fee of $7,500 for DG units that require a source test for recertification. This fee is based on staff time estimates of about 20 hours for applications that do not contain source test results, and about 60 hours to process applications that do contain source test results.

Currently, applicants seeking voluntary certification for DG technologies that do not emit an air contaminant are not charged any application fee. The ARB staff proposes to assess a fee of $2,500 for manufacturers seeking voluntary certification. To date, ARB has not received any applications for voluntary certifications.

Since the waste-gas emission standards are five years apart (2008 and 2013) ARB staff is proposing that certifications issued to units meeting the 2008 standards on waste gas be valid for five years or to January 1, 2013, whichever comes first. For consistency, staff is proposing to expand the duration of certifications based on the 2007 fossil fuel standards from four years to five years as well.

ARB staff is proposing to expand the allowable exemptions to the regulation to include units operated by the manufacturer for quality assurance testing, and units that are part of a research operation that the Executive Officer has approved. Staff is also proposing to clarify that all portable electrical generation technologies are exempt from this program, not just those that are registered in

ARB's Portable Equipment Registration Program. These other portable DG units are already regulated under other ARB and United States Environmental Protection Agency (U.S. EPA) programs.

ARB staff is proposing to modify the inspection and enforcement provisions in the regulation, modify and add terms in the definitions section, and make other editorial changes throughout the regulation. These changes are considered to be non-substantive and are intended to improve and clarify the DG Certification regulation.

F. ENVIRONMENTAL AND ECONOMIC IMPACTS OF THE PROPOSED AMENDMENTS

1. What are the expected environmental impacts of the proposed amendments?

The proposed amendments to the DG Certification regulation will reduce emissions of NOx, CO, and VOCs from DG technologies exempt from local air district permits and used in waste-gas applications. Currently, these technologies have to obtain permits from the local air districts. Inclusion of these waste-gas applications into the DG certification program will subject the technologies to more stringent emission standards than is typically required by the local air districts, especially when considering that these technologies must meet central station power plant emission levels by 2013.

2. What are the economic impacts of the proposed amendments?

The overall statewide cost of the proposed amendments is estimated to be $1,800,000 with an estimated individual business cost of $135,000 to $158,000 for each DG model certified (assuming each unit is certified to operate on three waste gas fuels). Businesses will incur costs for conducting an emissions source test on each DG model and fuel type to be certified, preparing and submitting a certification application, and paying an application fee.

Manufacturers should not incur significant adverse economic impacts from complying with the proposed 2013 waste-gas emission standards, as these standards are similar to the 2007 standards with which manufacturers must currently comply for their natural-gas-fueled units. ARB staff believes that fuel cells can currently meet the 2013 standards, but that microturbines will need more time to achieve these standards on waste gases. The January 1, 2013, compliance date will give manufacturers five years to research and develop new products to meet central station emission limits with waste gases. Much of the research and development effort needed to meet the 2013 standards will have already been spent on achieving the 2007 natural gas standard.

G. NEXT STEPS

Upon Board approval of the proposed amendments to the DG Certification regulation, ARB staff will conduct outreach efforts with affected manufacturers regarding the new requirements and continue to implement the DG Certification program.

H. RECOMMENDATIONS

The staff recommends that the Board approve the proposed amendments to the DG Certification regulation. The amendments fulfill the technology review requirements in the regulation by addressing necessary changes to the emissions durability and testing requirements. The proposed amendments also include changes to other sections that improve the DG Certification program. Finally, the amendments ensure unpermitted waste-gas technologies conform to the intent of SB 1298 by being added to the certification program as soon as possible.

I. INTRODUCTION

In this chapter, the Air Resources Board (ARB of Board) staff provides an overview of this report, discusses the purpose of the proposed amendments (included in Appendix A), discusses the regulatory authority ARB has to adopt the proposed amendments, and discusses the outreach efforts undertaken by ARB staff while developing the proposed amendments.

A. OVERVIEW AND REGULATORY AUTHORITY

Distributed generation refers to replacing or supplementing electricity from the grid with electrical generation sources that are located near the place of use. Some examples of electrical generation technologies are engines, turbines, fuel cells, and photovoltaic cells. Some businesses choose to operate distributed generation technologies with heat recovery systems that capture the heat produced from the electrical generation process. This captured heat can then be used to heat water, provide steam, or power a chiller. Distributed generation can be used at various types of businesses such as hospitals, schools, libraries, breweries, and laundries.

Senate Bill (SB) 1298 (chaptered in 2000) required the ARB to establish a Distributed Generation (DG) certification program for electrical generation technologies that are exempt from local air district permits. The Board approved the DG Certification regulation on November 15, 2001; the regulation was effective on October 4, 2002, and was codified in Title 17, California Code of Regulations (CCR) sections 94200 to 94214.

SB 1298 (which is included in Appendix B) mandated that the ARB establish at least two levels of emission standards for affected DG technologies. The law required that the first set of standards be effective no later than January 1, 2003, and reflect the best performance achieved in practice by existing DG technologies that are exempt from district permits. The law also required that, by the earliest practicable date, the standards be made equivalent to the level determined by the ARB to be the best available control technology (BACT) for permitted central station power plants in California. The emission standards were to be expressed in pounds per megawatt hour (lb/MW-hr) to reflect the efficiencies of various electrical generation technologies. In addition to establishing emission standards, the DG Certification regulation included testing protocols, calculation procedures, and other specified requirements that manufacturers must satisfy to certify DG technologies.

The DG Certification regulation required the ARB staff to conduct a technology review by July 2005 and to address four specific issues: the feasibility of the

2007 standards, the credit given for utilizing combined heat and power (CHP•) to meet these standards, the test methods and procedures, and the emissions durability. Evaluating these specific requirements was the basis of ARB staff's evaluation; however, ARB staff also evaluated other additions and changes to the regulation during the review. In addition, staff is proposing to add requirements to certify units operating on waste fuels, modify recordkeeping, recertification, and fee requirements, and modify other sections of the regulation to increase the clarity and enforceability of the regulation.

This report provides:

- a discussion of certified distributed generation technologies;
- a summary of the proposed amendments to the DG Certification regulation;
- environmental and economic impacts of the proposed amendments;
- the proposed amended DG Certification regulation; and
- other supplemental information.

B. PUBLIC OUTREACH

In developing any regulation, the public, local air districts, and affected industries play an important role in shaping the regulatory proposals. The ARB staff has made extensive efforts to have an open process and provide ample opportunity for input by all parties.

The ARB staff formed a workgroup in May 2004 to seek assistance from stakeholders with conducting the 2005 technology review and developing the amendments to the DG Certification regulation. The workgroup consisted of approximately 30 individuals representing manufacturers of DG technologies, environmental groups, the California Energy Commission, utility companies, local air districts, and other interested parties. ARB staff held the first workgroup meeting on June 2, 2004, in Sacramento. Staff convened seven subsequent workgroup meetings: August 19, 2004, October 22, 2004, January 13, 2005, January 27, 2006, March 30, 2006, May 9, 2006, and June 13, 2006. Staff presented draft proposed amendments at a public consultation meeting on July 6, 2006, to invite discussion and comment by stakeholders and the public.

The ARB staff has maintained a website to facilitate the dissemination of up-to-date information on the progress of the modifications to the DG Certification regulation. The website is located at *http://www.arb.ca.gov/energy/dg/dg.htm*. In addition, ARB staff also used an e-mail list serve to notify affected industries and

• Combined heat and power (CHP) refers to the total amount of useful energy obtained from the DG equipment. It is the sum of the electrical output of the unit plus the amount of waste heat utilized in a productive manner, such as heating water or providing heat to industrial processes. These combined energy outputs are used to calculate the total megawatt-hours produced, and are therefore used when determining the emissions in pounds per megawatt-hour.

other interested parties of the workgroup meetings, agendas, and information to be discussed at the meetings. Approximately 1,200 individuals from federal, state, and local government, environmental groups, and industry subscribe to the list serve.

Staff participated in numerous individual meetings and conference calls with affected industry and other stakeholders to discuss and resolve issues specific to the proposed amendments. Staff also held conference calls with source testing representatives and manufacturers to discuss specific testing issues.

Staff revised the proposed amendments to the regulation in consideration of the comments received during the public process. Staff made every effort to consider all comments and recommendations received.

II. OVERVIEW OF CERTIFIED DISTRIBUTED GENERATION TECHNOLOGIES

This chapter provides an overview of DG technologies that have been certified under this program. The overview includes a discussion of the types, inventory, uses, and health benefits from certified DG units in California.

A. DESCRIPTION OF CERTIFIED DG TECHNOLOGIES

Stationary sources of air pollution are subject to permitting requirements by the local air districts. However, some stationary sources of air contaminants are exempt from permits because of their small size and/or low emission rates. Electrical generation technologies that are exempt from local air districts' permit requirements are subject to the ARB's certification program.

Permit exemption levels vary among California's 35 local air districts, although microturbines up to 250 kilowatts (kW) in size are generally exempt from district permits, as are fuel cells of any size and reciprocating engines less than 50 horsepower. Although small engines may be exempt from local air district permits, most engines used in distributed generation applications are considerably larger than 50 horsepower and therefore require district permits. Consequently, only two types of DG technologies have been certified under ARB's DG Certification program: microturbines and fuel cells. A description of these two technologies follows.

1. Microturbines

Microturbines are high-speed, single-rotor turbines that are generally 250 kW or less in size and can burn natural gas, liquified petroleum gas (LPG), or waste gases. They can operate alone or in parallel with a number of units. Five microturbine models have been certified to date: a 60-kW unit, two 70-kW units, a 100-kW unit, and a 250-kW unit.

Microturbines have been utilized in numerous DG applications. To date, about 70 percent of the microturbines in California are used with natural gas, providing power to buildings, such as schools, hospitals, and laundries. The other 30 percent have been used in waste-gas applications, with landfills outpacing digesters by two-to-one. There are some oil-field waste-gas applications as well.

2. Fuel Cells

A fuel cell is an electrochemical device that combines hydrogen with oxygen to produce electricity, heat, and water. A fuel cell consists of an anode, cathode, and electrolyte. Electrochemical oxidation and reduction reactions take place at the electrodes to produce electrical current. Each individual fuel cell produces less than one volt, so cells are stacked to obtain the desired voltage.

The hydrogen fuel can be supplied through a hydrogen tank, or, more likely, with a reformer that extracts the hydrogen from a fossil fuel, such as natural gas. There are five types of fuel cells: phosphoric acid, molten carbonate, solid oxide, alkaline, and proton exchange membrane. Five fuel cell models have been certified to date: a 5-kW proton exchange membrane unit, two 250-kW molten carbonate units, a 1-MW molten carbonate unit, and a 200-kW phosphoric acid unit.

Fuel cells, because of their expense and restrictions on fuel quality, have been used predominantly in natural gas applications, although there are a handful of digester applications. Currently, there are no landfill or oil field applications with fuel cells.

B. INVENTORY OF DG TECHNOLOGIES

When the Board adopted the DG Certification regulation in 2001, the types of DG technologies expected to be subject to certification were just entering the California market. It was unclear as to where these units would ultimately be placed or what type of fuel they would use.

The ARB staff surveyed the six manufacturers with certified equipment and asked them to inventory their DG units located in California by model, fuel type, and usage of combined heat and power (CHP). The fuel types listed in the survey were natural gas, LPG, oil-field waste gas, landfill gas, and digester gas. For the CHP usage, the manufacturers indicated whether or not the units were equipped for waste heat recovery. The amount of waste heat recovered by the customers at each site was generally not available to the manufacturers, so the survey did not request that data. For those units operating on natural gas, the survey asked the manufacturers to include the types of facilities where these units are located.

The results indicated that there are about 700 microturbines and fuel cells in California capable of producing more than 41 MW of electricity. Of the 700 units, four percent are fuel cells. Roughly half of the 700 units are certified models using natural gas. Of the remaining, there are more than 100 units operating on natural gas that were purchased before the DG Certification program became effective in 2003. The final 200 units operate on waste-gas fuels and are permitted by the local air districts.

About a quarter of all the units are equipped with CHP, and most of these units operate on natural gas. The use of CHP with natural gas applications is not surprising. To be economically competitive with grid power, DG units using natural gas should have a significant demand for the waste heat generated, such as heating water, running an absorption chiller, or providing space heating in

buildings. Examples of locations of units fueled with natural gas using CHP are government facilities, schools, hotels, utilities, and libraries.

To put the currently ARB-certified DG equipment into perspective, California has a total of about 67,000 MW of total electricity production capabilities for the grid, with about 2,600 MW considered to be in the distributed generation size range, which is 20 MW or less in rated capacity. The units subject to this program represent 1.6 percent of the California DG market or 0.06 percent of the total electricity capable of being produced in the State for the grid.

C. PUBLIC HEALTH BENEFITS FROM CERTIFIED DG UNITS

Pursuant to SB 1298, the ARB DG Certification regulation requires DG technologies to meet stringent central station power plant emission standards by the earliest practicable date. Consequently, certified DG technologies are much cleaner than other, more traditional types of DG technologies, such as small turbines and reciprocating engines.

Calculating specific health benefits associated with the DG certification program is difficult, largely due to the low emissions and widespread deployment of the technologies. However, Table II-1 illustrates the more restrictive emission standards of the DG certification program compared to best available control technology (BACT) standards for small turbines, as permitted by local air districts.

Table II-1: Comparison of BACT Standards with Central Station Power Plant Standards (Lbs/MW-Hr)

Standard	NOx	CO	VOC
BACT for Small Turbines	0.5	6.0	1.0
Central Station Power Plant (required by SB 1298)	0.07	0.1	0.02
Reductions	86%	98%	98%

Since many DG applications are typically located in or near communities, it is certain that requiring these technologies to meet stringent emission standards protects the public health of California residents.

III. SUMMARY OF PROPOSED AMENDMENTS TO THE DG CERTIFICATION REGULATION

This chapter contains the purpose and conclusions of ARB's electrical generation technology review and a summary of the subsequent proposed amendments to the DG Certification regulation. A copy of the proposed amendments is located in Appendix A.

A. PURPOSE AND CONCLUSIONS OF TECHNOLOGY REVIEW

The current certification regulation required the ARB staff to conduct a technology review by July 2005 to evaluate if specific certification requirements should be modified. ARB staff committed to this review because at the time the regulation was adopted, the technologies that would be affected by the regulation had not yet entered or were just entering the California market. Very little information was available on these emerging technologies. Most of the units were still in the research and development stage and few were ready for commercialization.

The DG Certification regulation required that ARB's technology review address four specific areas of the regulation:

- the feasibility of 2007 standards;
- the credit given for utilizing combined heat and power (CHP) to meet these standards;
- the method for determining emissions durability; and
- the test methods and procedures used to certify a technology.

1. Feasibility of 2007 Standards

The current 2007 emission standards are based on central station power plant emission limits with an adjustment for distribution line loss. SB 1298 requires unpermitted DG technologies ultimately to meet these limits. At the time the regulation was adopted, fuel cells were expected to already be at these limits, but it was uncertain if microtubines could meet these limits by 2007. To date, ARB staff has certified six natural-gas-fueled DG units to the 2007 standards: five fuel cells, and one microturbine. Because these technologies have now been certified to the 2007 limits, staff believes these limits are feasible and is therefore not proposing any changes to the January 1, 2007, compliance date.

However, the ARB staff is proposing two minor changes to the 2007 standards: 1) specifying that these standards are applicable to fossil fuels (e.g., natural gas and liquefied petroleum gas (LPG)), and 2) eliminating the particulate matter (PM) emission standard. As will be discussed later, staff is proposing to bifurcate the DG Certification regulation into standards for fossil fuels and standards for waste-gas fuels. Staff is proposing that LPG be included with natural gas as a

fossil fuel subject to the 2007 standards and that LPG be specified as meeting the standards of HD-5 propane.

The current 2007 PM emission standard is essentially the sulfur limit in Public Utility Commission (PUC) grade natural gas (one grain of sulfur per 100 standard cubic feet). Staff is proposing to eliminate this PM standard for natural gas because it is redundant: "natural gas" is defined in the regulation as PUC-quality gas. Staff proposes to not include a PM standard for LPG, as it is not expected to have any measurable amount of PM emissions.

2. Combined Heat and Power Benefit

The current regulation allows a manufacturer to use an energy credit to meet the 2007 standards if the unit is integrated and sold with combined heat and power (CHP) and the unit can achieve a minimum overall efficiency of 60 percent. The credit allows the recovered waste heat to be added to the total energy production of the DG unit at the rate of 1 MW-hr for each 3.4 million Btu's of recovered waste heat.

The credit given was based on limited information that was available at the time the regulation was developed. During the technology review, ARB staff spent an extensive amount of time searching for data related to the amount of waste heat utilized by facilities with certified equipment. As this is a manufacturer's certification program, facilities are not required to record the amount of waste heat recovered. This made it difficult for the ARB staff to assess if and how credit for CHP should be altered. The ARB staff concluded that there is no compelling data to alter the method or amount of credit given for CHP and is therefore not proposing any changes to the CHP credit. The staff is, however, proposing to clarify that CHP is based on electricity and useful heat from the unit (the heat that can actually be captured and used for other processes such as heating water and running an absorption chiller).

3. Emissions Durability

When the regulation was adopted, in-the-field source test data was not available for DG units to demonstrate the emissions durability of these emerging technologies. Staff included in the DG Certification regulation a requirement that certified units must meet the emission standards over a 15,000-hour operating period. Since newly certified DG technologies did not have 15,000 hours of operating time, this requirement became more of a technical discussion within the certification application.

There is still very little source test data on units in the field to indicate how well certified DG units are capable of maintaining compliance with the emission standards because there is no requirement for manufacturers to test the units sold to their customers. To require such testing would essentially undermine the

concept of certifying equipment at the manufacturers' level, so the ARB staff considered other approaches to addressing durability. The ARB staff has determined that this can best be accomplished through a combination of additional data submittal, recordkeeping, and reporting requirements.

As proposed, a manufacturer would be required to identify the components of the DG unit that are most critical to ensuring compliance with the emission limits, such as fuel injectors, rotors, seals, and bearings for a microturbine, and fuel cell stacks and catalysts for fuel cells. In addition, the manufacturer will be required to keep records relating to how often these components are replaced and submit the records to the ARB staff at our request. In this manner, ARB staff will be able to track durability of equipment in the field and determine if a certification should be reviewed.

4. Test Methods and Procedures

Staff is proposing a number of modifications to the testing requirements and procedures section of the regulation.

a. Modify VOC Test Method

The regulation currently requires ARB Method 100 to be used to test NOx, CO, VOC, and oxygen. The VOC testing in Method 100 includes all volatile organic compounds. It was never ARB staff's intent to include methane and ethane in certification emission calculations. Consequently, staff is proposing to add a VOC method that would result in non-methane, non-ethane emission calculations and would provide more accuracy when measuring the low emission concentrations from technologies certified under this program. After discussing VOC test methods with ARB staff in the Monitoring and Laboratory Division, local air district staff, and the manufacturers' source-testing firms, ARB staff has determined that the best test method to use for the certification program is South Coast Air Quality Management District's source test method 25.3. A copy of test method 25.3 is included in Appendix C.

b. Eliminate Partial Load Testing

The current regulation requires testing at 50-percent, 75-percent, and 100-percent loads, with the certification emission rate calculated on a weighted emission rate basis. The three-load testing procedure was included in the regulation because at the time of adoption, there was concern that certified DG units—microturbines in particular—would be frequently operated at partial loads. During the technology review, ARB staff was able to evaluate usage data for certified DG units. The data indicated that most of these units are typically operated at full capacity and that these units are rarely used in a load-following mode. Consequently, the ARB staff is proposing to alter the testing procedure to require testing at only 100 percent load.

c. Eliminate Pre-Commercial Operation NOx Testing

Currently, manufacturers are required to test NOx emissions for each individual certified DG unit built for sale in California. The NOx emissions are to be tested using a portable testing device. During the implementation of the certification program, ARB staff determined that no portable devices exist that are capable of accurately measuring NOx emissions at the extremely low concentrations emitted by the devices certified pursuant to this program. In fact, measuring such low NOx emissions using state-of-the-art source test methods has proved to be challenging for manufacturers during the certification process. Therefore, the ARB staff is proposing to remove this ineffective NOx-testing requirement from the DG Certification regulation.

d. Other Changes to Testing Parameters

The ARB staff is proposing to add a method that manufacturers must use to calculate the amount of waste heat recovered from a unit's heat recovery system for purposes of calculating the CHP credit. Local air districts and industry representatives requested that ARB staff specify a method for calculating the amount of waste heat recovered to be used for this credit. The method proposed would utilize a water loop, wherein waste heat is transferred to a body of water which is allowed to cool before returning to absorb more energy, similar to a radiator in a car. The amount of waste heat recovered can be determined by the difference in temperature before and after the heat exchanger and the flow rate of the water.

Finally, staff is proposing to clarify that the generator output measured during the source test should be based on net power output, not the gross output of the unit. The generator output is used to calculate the lbs/MW-hr emission rate of the unit being certified. Measuring the net output will more accurately represent the actual available power from the unit.

B. OTHER PROPOSED MODIFICATIONS TO THE DG CERTIFICATION REGULATION

ARB staff considered other possible revisions to the DG Certification regulation not associated with the required technology review. The most significant of these proposed changes pertains to the inclusion of waste-gas applications of permit-exempt DG equipment. Other proposed revisions are intended to strengthen and clarify the regulation.

1. Addition of Waste Gas Emission Standards

Staff is proposing to add a certification protocol through which DG technologies that are using waste gas for fuel and are exempt from local air district permits can be certified through the ARB DG certification program. The current

regulation, although allowing for fuels other than natural gas to be used for certification, does not contain a practical method in which to accomplish this. The composition of waste fuels varies from site to site and season to season. Therefore, local air districts have had to issue permits to otherwise permit-exempt equipment. The ARB staff proposes to bring these waste-gas applications into the DG certification program where they appropriately belong.

At the time the certification program was originally adopted, there was general consensus that waste-gas-fueled DG units would be subject to district permitting. During the technology review, ARB staff found that a number of microturbines and fuel cells sold in California were fueled by waste gases, but were exempt from local air district permits. Because SB 1298 requires every DG unit in California to be either permitted by the district or certified by the ARB, ARB staff asked the districts to issue permits for these applications until the regulation could be adjusted to accommodate waste-gas certifications.

The local air districts have been issuing permits to these applications but support integrating waste gas applications into the certification program. Manufacturers are also supportive of the ARB including waste-gas applications in the certification program, as this would be less costly and burdensome for their customers, who are obtaining individual project permits.

The ARB staff determined that to certify DG technologies on waste gas, this type of fuel would need to be defined in the regulation. As mentioned previously, the composition of waste gas varies from site to site and season to season. Staff determined that surrogate waste-gas fuels would be required.

The ARB staff collected speciation data on waste gases from digesters, landfills, and oil field sites. Staff evaluated the data, identified the major constituents of the waste-gas streams, and developed proposed surrogate gases for these three waste-gas applications (digesters, landfills, and oil-field waste gases). The surrogate waste-gas fuels are defined as follows:

- Digester gas – 60 to 65 percent methane and 35 to 40 percent carbon dioxide
- Landfill gas – 42 to 46 percent methane, 34 to 38 percent carbon dioxide, and 18 to 22 percent nitrogen
- Oil-field waste gas – 63 to 71 percent methane, 6 to 8 percent ethane, 9 to 11 percent propane, 7 to 9 percent carbon dioxide, and 7 to 9 percent carbon compounds with four or more carbon atoms per molecule

Manufacturers would be required to use these surrogate gases to certify for any of these waste-gas applications. They could certify to any or all of these fuels, depending on their business plans.

Staff is proposing two sets of waste gas standards, much like what is currently in the regulation. Staff is proposing 2008 interim waste-gas standards that are similar to the current 2003 limits. Unlike the 2003 standards, the waste-gas 2008 standards would not include a particulate matter (PM) standard nor would they include a separate, less stringent, set of limits for units integrated with CHP. A PM standard is not being proposed because the impurities in waste gas that would contribute to PM emissions will be removed prior to being used with DG units in the field. Staff is not proposing to include less stringent 2008 limits for units integrated with CHP because manufacturers would now only have to test at 100 percent power load, which should allow them to meet the more stringent limits.

The proposed 2013 waste-gas standards are identical to the current 2007 limits, except for the omission of a PM standard as described above. The 2013 standards reflect central station power plant emissions, as required in SB 1298. As with the 2007 standards, a manufacturer can use a CHP credit to meet the 2013 standards if the unit is integrated and sold with a heat recovery system and can achieve a minimum efficiency of 60 percent. The proposed waste-gas emission standards are presented in Table III-1 below.

Table III-1: Proposed Waste Gas Emission Standards

Pollutant	Emission Standard (lb/MW-hr)	
	On or after January 1, 2008	On or after January 1, 2013
NO_x	0.5	0.07
CO	6.0	0.10
VOCs	1.0	0.02

As mentioned earlier, the ARB staff is proposing to remove the particulate matter (PM) emission standard from the 2007 standards because we do not expect any significant PM emissions from gaseous fuels. Similarly, staff is not proposing a PM standard for waste-gas certification. Surrogate gases do not contain the impurities that are present in waste gas fuels, such as siloxanes and sulfur compounds, which would contribute to PM emissions. Waste-gas fuels in the field will require treatment to remove these impurities prior to being used in microturbines or fuel cells.

Manufacturers of DG technologies that are integrated with CHP will be able to calculate an energy credit for the useful waste heat recovered to meet the 2013 emission standards, the same credit that is allowed for meeting the current 2007 standards. The credit allows the recovered waste heat to be added to the total energy production of the DG unit at the rate of 1 MW-hr for each 3.4 million Btu's of recovered waste heat. To encourage the use of high efficiency CHP, the credit can only be taken when the DG technology is integrated with the CHP package and the unit can achieve a minimum efficiency of 60 percent.

Based on manufacturers' source test data and source test data from users of microturbines and fuel cells fueled by waste gases, ARB staff believes that both fuel cells and microturbines can currently meet the 2008 standards. A summary of the source test data ARB staff collected for waste gas applications is included in Appendix D. Staff believes that the January 1, 2008, compliance date will provide the manufactures with enough lead time to obtain certification for their waste gas units.

ARB staff believes that fuel cells can currently meet the 2013 standards, but that microturbines will need more time to achieve these standards on waste gas. The January 1, 2013, compliance date will give manufacturers five years to research and develop new products to meet central station emission limits with waste gas. Much of the research and development effort needed to meet the 2013 standards will have already been spent on achieving the 2007 natural gas standards.

2. Fees

ARB staff is proposing to increase fees to fully cover costs to the State to implement this program, as allowed by SB 1298. Initial certification application fees under the proposed amendments would increase from $2,500 to $7,500. Staff had estimated $2,500 per application when the DG certification program was being developed in 2001, but subsequent experience with the program has shown the original fee estimate to be inadequate to recover the cost of implementing the DG certification program. The new fee is based on an estimate of about 60 hours of the ARB staff time to review the certification applications.

Manufacturers of technologies that can meet the 2013 standards by January 1, 2008 (such as fuel cells), will be exempt from submitting an initial fee. ARB staff is proposing no initial application fee for these technologies to provide an economic incentive for early introduction of the cleanest waste-gas-fueled DG technologies.

ARB staff is proposing a fee to cover the costs incurred by ARB for staff time required to process voluntary applications. Currently, applicants seeking voluntary certification would not be charged any application fee. Manufacturers of technologies that are seeking voluntary certification (those technologies that do not emit an air contaminant) would be required to submit a fee of $2,500. Staff estimates that it would take about 20 hours to process applications that do not contain source test results. To date, ARB has not received any applications for voluntary certifications.

The current fee assessment for recertification is $2,500. The ARB staff proposes to maintain that fee for DG units that do not require a source test for recertification. Staff proposes to assess a fee of $7,500 for DG units that require a source test for recertification. This fee is based on staff time estimates of about

20 hours for applications that do not contain source test results, and about 60 hours to process applications that do contain source test results.

3. Applicability

ARB staff is proposing to expand the allowable exemptions to the regulation to include units operated by the manufacturer for quality assurance testing, and units that are part of a research operation which the Executive Officer has approved.

Staff is also proposing to clarify that all portable electrical generation technologies are exempt from this program, not just those that are registered in ARB's Portable Equipment Registration Program. Portable DG technologies have not been certified under this program, nor is it ARB's intent to subject them to the certification regulation. These small portable DG units are already regulated under other ARB and United States Environmental Protection Agency (U.S. EPA) programs. Small natural gas (or spark-ignition engine) units are regulated under ARB's Small Off-Road Engine (SORE) program. Small diesel engines are subject to U.S. EPA standards.

4. Recertification

Since the waste-gas emission standards are five years apart (2008 and 2013) ARB staff is proposing that certifications issued to units meeting the 2008 standards on waste gas be valid for five years or to January 1, 2013, whichever comes first. For consistency, staff is proposing to expand the duration of certifications based on the 2007 fossil fuel standards from four years to five years as well.

Staff is proposing that when currently certified DG units are recertified, they will be subject to the proposed new requirements. This may include submitting more information in their recertification application regarding emissions durability design and the unit's critical components. This will ensure that certified units continue to meet clean technology standards.

5. Other Proposed Changes

ARB staff is proposing to modify the inspection and enforcement provisions in the regulation, modify and add terms in the definitions section, and make other editorial changes throughout the regulation. These changes are considered to be non-substantive and are intended to improve and clarify the DG Certification regulation.

C. ALTERNATIVES CONSIDERED

The current DG Certification regulation required a technology review for consideration of revisions to the regulation. After conducting the technology review, staff believed that there were revisions that could make the regulation clearer and more effective. Nevertheless, there remained the option of taking no action to amend the existing regulation. The regulation has been in effect for five years with a number of units being certified. ARB staff was able to address testing and reporting issues that arose during this time without regulatory changes. However, it is ARB's responsibility to ensure unpermitted waste-gas technologies conform to the intent of SB 1298 and be added to the certification program as soon as possible. Therefore, the ARB staff determined that is was essential to amend the certification regulation now to include the waste gas applications. Once staff decided to revise the DG Certification regulation, we assessed the need for other improvements and clarifications to the regulation and proposed additional revisions.

IV. ENVIRONMENTAL IMPACTS OF PROPOSED AMENDMENTS

The ARB staff has conducted an analysis of the potential environmental impacts of the proposed amendments to the DG Certification regulation. Based on our analysis, we have determined that the proposed amendments would have no significant adverse environmental impacts.

A. LEGAL REQUIREMENTS APPLICABLE TO THE ENVIRONMENTAL IMPACT ANALYSIS

The California Environmental Quality Act (CEQA) and the ARB policy require an analysis to determine the potential environmental impacts of proposed regulations. The Secretary of Resources, pursuant to Public Resources Code section 21080.5, has certified the ARB rulemaking process. Consequently, the CEQA environmental analysis requirements may be included in the Initial Statement of Reasons (ISOR) for this rulemaking. The ISOR serves as a functionally equivalent document of an initial study, a Negative Declaration, and an Environmental Impact Report. In addition, staff will respond, in the Final Statement of Reasons for the amendments to the regulation, to all significant environmental issues raised by the public during the public review period or at the Board public hearing.

Public Resources Code section 21159 requires that the environmental impact analysis conducted by the ARB include the following:

- An analysis of the reasonably foreseeable environmental impacts of the methods of compliance
- An analysis of reasonably foreseeable feasible mitigation measures
- An analysis of reasonably foreseeable alternative means of compliance with the amendments to the DG Certification regulation

Regarding mitigation measures, CEQA requires an agency to identify and adopt feasible mitigation measures that would minimize any significant adverse environmental impacts described in the environmental analysis.

B. AIR QUALITY IMPACTS OF THE PROPOSED AMENDMENTS

The proposed amendments to the DG Certification regulation will reduce emissions of NOx, CO, and VOCs from DG technologies exempt from local air district permits and used in waste-gas applications. Currently, these technologies have to obtain permits from the local air districts. Inclusion of these waste-gas applications into the DG certification program will subject the technologies to more stringent emission standards than is typically required by the local air districts for similar DG units—such as small turbines and reciprocating engines—especially when considering that these technologies must

meet central power plant emission levels by 2013. (See Table II-1 on page 6 for illustrative example.)

C. REASONABLY FORESEEABLE ENVIRONMENTAL IMPACTS OF THE METHODS OF COMPLIANCE

The ARB staff has not identified any significant adverse environmental impacts from complying with the amendments to the DG Certification regulation.

D. REASONABLY FORESEEABLE MITIGATION MEASURES

CEQA requires an agency to identify and adopt feasible mitigation measures that would minimize any significant adverse environmental impacts described in the environmental analysis. ARB staff has concluded that no significant adverse environmental impact would occur from adoption of, and compliance with, the proposed amendments to the DG Certification regulation. Therefore, no mitigation measures would be necessary.

E. REASONABLY FORESEEABLE ALTERNATIVE MEANS OF COMPLIANCE WITH THE PROPOSED AMENDMENTS

The ARB is required to do an analysis of reasonably foreseeable alternative means of compliance with the proposed amendments to the DG Certification regulation. The ARB staff concluded that the proposed amendments provide the greatest degree of flexibility and the least burdensome approach to reducing public exposure to emissions from new DG technologies and complying with SB 1298.

F. ENVIRONMENTAL JUSTICE

ARB is committed to evaluating community impacts of proposed regulations including environmental justice concerns. Because some communities experience higher exposure to air pollutants, it is a priority of ARB to ensure that full protection is afforded to all Californians. The proposed amendments to the DG Certification regulation are not expected to result in significant negative impacts in any community. The proposed amendments to the DG Certification regulation would likely result in decreased emissions of NOx, VOC, and CO. These reductions would occur by adding waste-gas-fueled technologies to the certification program. The proposed amendments would reduce the exposure to pollutants to residents and off-site workers near the operation of certified DG units fueled by waste gases.

V. ECONOMIC IMPACTS OF PROPOSED AMENDMENTS

This chapter discusses the economic impacts that the proposed amendments to the DG Certification regulation may have on businesses.

Some of the amendments staff is proposing to the DG Certification regulation are expected to have a positive economic impact on affected manufacturers. Source-testing efforts will be reduced by requiring testing at only 100-percent load instead of the current requirement of testing at three power-production loads. In addition, each certified DG unit will no longer require a test for NOx emissions using a NOx analyzer prior to commercial operation. And finally, the DG certification duration will be extended from four years to five years, furthering the positive economic impact for manufacturers.

The ARB staff does not expect complying with the proposed waste-gas standards to cause adverse economic impacts on businesses. ARB staff believes that both fuel cells and microturbines operating on waste gases can currently meet the proposed 2008 standards. Manufacturers should not incur significant adverse economic impacts from complying with the proposed 2013 waste-gas emission standards, as these standards are similar to the 2007 standards with which manufacturers must currently comply for their natural-gas-fueled units. ARB staff believes that fuel cells can currently meet the 2013 standards, but that microturbines will need more time to achieve these standards on waste gases. The January 1, 2013, compliance date will give manufacturers five years to research and develop new products to meet central station emission limits with waste gases. Much of the research and development effort needed to meet the 2013 standards will have already been spent on achieving the 2007 natural gas standard.

The overall statewide cost of the proposed amendments is estimated to be $1,800,000, with an estimated individual business cost of $ 135,000 to $158,000 for each DG model certified (assuming each unit is certified to operate on three waste gas fuels). Businesses will incur costs for conducting an emissions source test on each DG model and fuel type to be certified, preparing and submitting a certification application, and paying an application fee.

The proposed amendments to the DG Certification regulation are not expected to cause a noticeable change in California employment or business status.

A. LEGAL REQUIREMENT

Section 11346.3 of the Government Code requires State agencies to assess the potential for adverse economic impacts on California business enterprises and individuals when proposing to adopt or amend any administrative regulation. The assessment shall include a consideration of the impact of the proposed

regulation on California jobs, business expansion, elimination, or creation, and the ability of California businesses to compete.

Also, State agencies are required to estimate the cost or savings to any State or local agency and school district in accordance with instructions adopted by the Department of Finance. The estimate shall include any non-discretionary cost or savings to local agencies and the cost or savings in federal funding to the State.

Health and Safety Code section 57005 requires the ARB staff to perform an economic impact analysis of submitted alternatives to a proposed regulation before adopting any major regulation. A major regulation is defined as a regulation that will have a potential cost to California business enterprises in an amount exceeding ten million dollars in any single year. The proposed revisions to the certification program do not constitute a major regulation.

B. SUMMARY OF THE ECONOMIC IMPACTS

The businesses that may be affected by the amendments to the DG Certification regulation fall primarily into two Standard Industrial Classifications (SICs)/new North American Industry Classifications (NAICs). A list of the industries that the ARB staff has been able to identify is provided in Table V-1.

Table V-1: Potential Industries Affected by the Proposed Amendments to the DG Certification regulation

SIC/NAIC	Industry
3511/333611	Turbine and turbine generator set units manufacturing
3629/335999	Fuel cells, electrochemical generators manufacturing

The ARB staff has identified six manufacturers that will potentially be impacted by the proposed amendments: the same manufacturers who have already certified their units on natural gas. Only one of these companies is in California. Two of these companies are small businesses and neither company is in California. Table V-2 summarizes potentially affected manufactures by technology type and location.

Table V-2: DG Manufacturers by Technology Type and Location

DG Technology	Non-California Company	California Company	Total
Microturbines	2	1	3
Fuel Cells	3	0	3
Total	5	1	6

C. COST IMPACTS TO BUSINESSES

Costs to affected businesses for complying with the proposed waste gas emission standards can be divided into three major areas: the cost of an application fee, the cost for preparing a certification application package, and the cost to perform emissions source testing. The three major areas are listed below:

1. Application Fees

The proposed amendments would change the fee structure of the program to fully cover costs to the State to implement this program. The application fee for initial certification of a natural-gas-fueled unit is proposed to increase $5,000, from $2,500 to $7,500. Under the proposed amendments, initial certifications of units operating on waste gas will require an application fee of $7,500 per fuel. This fee is based on an estimate of 60 hours of the ARB staff time to review the certification applications. Manufacturers of technologies that can meet the proposed 2013 standards by 2008 (such as fuel cells) will be exempt from submitting an initial fee.

Manufacturers of technologies that are seeking voluntary certification (those technologies that do not emit an air contaminant) would be required to submit a fee of $2,500 per fuel, although, to date, ARB has not received any applications for voluntary certifications.

DG units that do not require a source test for recertification will be assessed a fee of $2,500 per fuel. Recertification of a DG unit that requires a source test will be assessed a fee of $7,500 per fuel.

2. Application Preparation Costs

ARB staff assumed that the estimated cost to the manufacturer to prepare a certification application package that contains all of the required information and supporting data is approximately $15,000. This cost is based on an estimate of 120 hours of the manufacturer's time to prepare the application and to arrange and oversee the source testing required for the application.

3. Source Testing Costs

Manufacturers will be required to provide a source test report in their certification application to demonstrate compliance with the proposed waste gas emission standards. The ARB staff has identified three types of waste gases that can be used to fuel a DG unit: digester, landfill, and oil-field waste gas. A manufacturer must source test a DG unit on each type of waste gas that will be used for operating the unit in California. Each certification will be specific to the type of waste gas tested. Consequently, a DG unit could require up to six separate

sources tests: one for each of the three waste gases to meet both the 2008 and 2013 emission standards.

The estimated cost for performing the source tests and analyzing the results is $10,000. The source-test cost estimate is based on discussions with manufacturers and private source-testing companies. The estimated cost for supplying enough waste gas to perform a source test is $20,000. The waste gas cost estimate is based on surveying manufacturers and representatives from the Advanced Power and Energy Program at University of California, Irvine.

4. Summary of Compliance Costs

Based upon the number of microturbines currently certified, ARB staff anticipates two companies will certify one unit each and one company will certify two units to the 2008 waste-gas emission standards. Staff expects that these four units will also be certified at a later date to the 2013 waste-gas emission standards. Similarly, based upon the number of fuel cells currently certified, ARB staff anticipates two companies will certify one unit each and one company will certify two units to the 2013 standards.

Each cost per fuel includes a $15,000 application preparation cost, a $10,000 source test cost, $20,000 for fuel to supply the source test, and either a $7,500 application fee for microturbines or no application fee for fuel cells due to early compliance with the 2013 standards. Therefore, the total cost per waste-gas certification should range from $45,000 for fuel cells to $52,500 for microturbines.

The overall statewide cost for complying with the 2008 waste gas standards is estimated to be $630,000, which is based on four microturbines being certified for all three waste-gas fuels (4 x 3 x $52,500). This cost is only applicable to microturbine manufacturers, as the ARB staff expects the fuel cells to be already capable of meeting the 2013 emission standards.

The overall statewide cost for complying with the 2013 waste-gas standards is estimated to be $1,170,000, which includes $630,000 from the microturbine manufacturers, as described above, and $540,000 from the fuel cell manufacturers (4 x 3 x $45,000). Fuel cells are expected to incur less cost for certifying to the 2013 standards than microtubines because the proposed amendments allow for an application fee exemption for technologies that demonstrate early compliance with the 2013 standards.

Table V-3 presents the cost per technology type to comply with the standards:

Table V-3: Cost per Technology Type for Complying with Proposed DG Certification Amendments

DG Technology	Cost ($) per Fuel	Possible Waste Gas Fuels Tested	Number of 2008 Certifications	Number of 2013 Certifications	Total ($)
Microturbine	52,500	3	4	4	1,260,000
Fuel Cell	45,000	3	0	4	540,000
Total Cost					1,800,000

To minimize the economic impact to manufacturers for complying with the 2013 standards, the ARB staff included provisions in the certification requirements for an energy credit for highly efficient combined heat and power packages that are integrated with DG technologies, similar to the current 2007 standards. Manufacturers may choose to sell their units in 2013 with integrated CHP to reduce any possible redesign costs. As was mentioned earlier in this chapter, much of the research and development effort needed to meet the 2013 waste-gas standards will have already been spent on achieving the 2007 standards for natural gas, as these standards are numerically identical. Therefore, manufacturers should incur similar costs for complying with the 2013 standards as they do for complying with the 2008 standards.

Although manufacturers will incur some costs up front for certifying to the waste-gas standards, having certified units may assist manufacturers with marketing their products in California. Customers would benefit from purchasing certified DG units because it eliminates the need for multiple, site-specific district permits and source testing, as is the case now.

D. POTENTIAL IMPACT ON BUSINESS COMPETITIVENESS

The proposed amendments are not expected to adversely impact California business competitiveness because all affected manufacturers that make products for sale into California will be required to meet the same emission standards requirements. Of the six DG manufacturers that have certified technologies for distribution in California, only one is located in California.

E. POTENTIAL IMPACT ON EMPLOYMENT, BUSINESS CREATION, ELIMINATION, OR EXPANSION

The proposed amendments are not expected to cause a noticeable change in California employment and business status. Based upon the current DG Certification program, all six companies are expected to experience economic impacts by the proposed amendments. These impacts should be offset by the positive impacts of the proposed amendments on all manufacturers. These

positive impacts will allow DG units to penetrate the California market and, in turn, allow for manufacturers to initiate production expansion.

F. POTENTIAL IMPACT ON SMALL BUSINESSES

The ARB staff has identified two out of six manufacturers as small businesses that will potentially be impacted by the proposed amendments. Both small businesses manufacture fuel cell technologies; however, neither company is in California. These businesses should incur costs of $135,000 for each DG unit certified to comply with the proposed 2013 waste-gas standards.

G. POTENTIAL IMPACT ON PUBLIC AGENCIES

The proposed amendments should have no significant fiscal impact on state or local agencies. It is anticipated that the ARB will incur costs starting in 2007 to certify distributed generation technologies to the waste gas emission standards. The proposed increase in certification fees from $2,500 to $7,500 coupled with existing budgets and resources should offset these costs.

The ARB staff will also be responsible for enforcing the requirements in the DG certification program including ensuring that DG units are meeting their certified limits in the field. Existing ARB staff should be able to accommodate the need to perform inspections of the certified units, thus allowing for additional costs to be absorbed within existing budgets.

VI. REFERENCES

1. California Air Resources Board. "Staff Report: Initial Statement of Reasons for the Proposal to Establish a Distributed Generation Certification Program." September 28, 2001.

2. California Energy Commission. "2005 Database of California Power Plants." July 28, 2006. http://www.energy.ca.gov/database/index.html#powerplants.

3. California Energy Commission. "California Energy Commission – Energy Facility Status." July 20, 2006. July 28, 2006. http://www.energy.ca.gov/sitingcases/all_projects.html.

4. Mauzey, Joshua L. and Vincent G. McDonell. "Cost Estimates for Surrogate Gas to Support SB1298 DG Certification." July 27, 2006.

5. Mueller, Marla. "Re: Fwd: DG in California." E-mail to ARB staff. July 12, 2006