

**ORIGINAL**

DIVISION OF CONSUMER ADVOCACY  
Department of Commerce and  
Consumer Affairs  
335 Merchant Street, Room 326  
Honolulu, Hawaii 96813  
Telephone: (808) 586-2800

PUBLIC UTILITIES  
COMMISSION

2013 JAN 25 P 4: 20

FILED

BEFORE THE PUBLIC UTILITIES COMMISSION  
OF THE STATE OF HAWAII

In the Matter of the Application of )  
 )  
HAWAIIAN ELECTRIC COMPANY, INC. )  
 )  
For Approval of the Biofuel Supply Contract )  
with Hawai'i BioEnergy, LLC and to include )  
the Biofuel Supply Contract's Costs in the )  
Hawaiian Electric's Energy Cost Adjustment )  
Clause. )

DOCKET NO. 2011-0369

**DIVISION OF CONSUMER ADVOCACY'S  
WRITTEN TESTIMONIES AND EXHIBITS**

Pursuant to the Schedule of Proceedings set forth in Amended Procedural Order No. 30900, filed on December 17, 2012, the Division of Consumer Advocacy hereby submits its **WRITTEN TESTIMONIES AND EXHIBITS** in the above docketed matter.

DATED: Honolulu, Hawaii, January 25, 2013.

Respectfully submitted,

By  \_\_\_\_\_  
JEFFREY T. ONO  
Executive Director

DIVISION OF CONSUMER ADVOCACY

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**J. HORNBY**

**WRITTEN TESTIMONY AND EXHIBITS**

**OF**

**J. RICHARD HORNBY**

**ON BEHALF OF  
THE DIVISION OF CONSUMER ADVOCACY**

**SUBJECT: PRICING RELATED ISSUES**

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1                                    **WRITTEN TESTIMONY OF J. RICHARD HORNBY**

2    **I. INTRODUCTION AND SUMMARY.**

3    Q.    PLEASE STATE YOUR NAME, EMPLOYER, AND PRESENT POSITION.

4    A.    My name is James Richard Hornby. I am a Senior Consultant at Synapse  
5           Energy Economics, Inc., 485 Massachusetts Avenue, Cambridge, MA 02139.

6  
7    Q.    ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS CASE?

8    A.    I am testifying on behalf of the Department of Commerce and Consumer  
9           Affairs of the State of Hawaii, as represented by the Division of Consumer  
10          Advocacy (“Consumer Advocate”).

11  
12   Q.    PLEASE DESCRIBE SYNAPSE ENERGY ECONOMICS.

13   A.    Synapse Energy Economics (“Synapse”) is a research and consulting firm  
14           specializing in energy and environmental issues, including: electric generation,  
15           transmission and distribution system reliability, market power, electricity  
16           market prices, stranded costs, efficiency, renewable energy, environmental  
17           quality, and nuclear power.

18  
19   Q.    PLEASE SUMMARIZE YOUR WORK EXPERIENCE AND EDUCATIONAL  
20           BACKGROUND.

21   A.    I am an energy consultant specializing in planning and ratemaking in the  
22           electric and gas industries. Over the past twenty five years, I have presented

1 expert testimony and provided litigation support on these issues in more  
2 than 120 proceedings in over thirty jurisdictions in the United States and  
3 Canada. Over this period, my clients have included staff of public utility  
4 commissions, state energy offices, consumer advocate offices and marketers.

5 Prior to joining Synapse in 2006, I was a Principal with  
6 CRA International and, prior to that, Tabors Caramanis & Associates.  
7 From 1986 to 1998, I worked with the Tellus Institute (formerly Energy  
8 Systems Research Group), initially as Manager of the Natural Gas Program  
9 and subsequently as Director of their Energy Group. Prior to 1986, I was  
10 Assistant Deputy Minister of Energy for the Province of Nova Scotia.

11 I have a Master of Science in Energy Technology and Policy from the  
12 Massachusetts Institute of Technology ("MIT") and a Bachelor of Industrial  
13 Engineering from the Technical University of Nova Scotia, now merged with  
14 Dalhousie University.

15 I have attached my resume to this testimony as CA-200.  
16

17 Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

18 A. On November 30, 2011, the Hawaiian Electric Company ("HECO" or  
19 "the Company") filed an application for approval of a Biofuel Supply Contract  
20 with Hawai'i BioEnergy, LLC ("HBE"). The Consumer Advocate retained  
21 Synapse to assist in its evaluation of that application. My testimony examines  
22 whether the proposed Biofuel Supply Contract is reasonable. I specifically



1 address the price premiums and corresponding values associated with this  
2 contract, which is the fourth issue the Hawaii Public Utilities Commission  
3 (“Commission”) listed on page 4 of its Amended Procedural Order No. 30900,  
4 Stipulation Regarding Amended Procedural Order, filed on  
5 December 17, 2012, in this proceeding.

6  
7 Q. WHAT SOURCES DID YOU RELY UPON TO PREPARE YOUR TESTIMONY  
8 AND EXHIBITS?

9 A. I relied on the Company’s application, its responses to various information  
10 requests (“IR”), recent projections of prices for relevant fossil fuels,  
11 Commission orders in other relevant proceedings, Hawaii energy policies and  
12 relevant resource planning proceedings of other utilities in which I have  
13 participated or which I have reviewed.

14  
15 Q. PLEASE SUMMARIZE THE COMPANY’S PROPOSED BIOFUEL SUPPLY  
16 CONTRACT WITH HBE.

17 A. Under the proposed contract, HECO would buy 10 million gallons of  
18 locally-produced biofuel per year for twenty years. HECO expects to produce  
19 electricity from this biofuel at Unit 3 of its Kahe Power Plant (“KPP”), either on  
20 its own or as a blend with Low Sulfur Fuel Oil (“LSFO”). The Company’s  
21 purchase of 10 million gallons of biofuel per year represents approximately  
22 5 percent of the annual LSFO it uses at KPP and 2 percent of the annual fossil

1 fuels it uses in all of its generating plants.<sup>1</sup> HECO would pay a price set [REDACTED]

2 [REDACTED]  
3 [REDACTED].

4 HBE proposes to produce the biofuel at a bio-refinery it would build on  
5 Kauai. Its feedstock would initially be existing invasive species, and once  
6 those are harvested, sustainable crops such as eucalyptus. HBE proposes to  
7 produce 22 million gallons of biofuel per year, of which it would sell 10 million  
8 to HECO and 12 million as a transportation fuel.<sup>2</sup>

9  
10 Q. PLEASE SUMMARIZE YOUR EVALUATION OF THE PROPOSED BIOFUEL  
11 SUPPLY CONTRACT.

12 A. My evaluation analyzed whether HECO's purchase of 10 million gallons of  
13 HBE biofuel per year would enable it to provide reliable service at reasonable  
14 rates as compared to continuing to purchase 10 million gallons of fossil fuels  
15 per year. First, I determined whether HECO would be paying a "premium" for  
16 biofuel under the HBE Contract relative to prices for the fossil fuels it would  
17 displace, and if so, the size and duration of that premium. That analysis  
18 focused on price premiums from 2017 onward, to reflect the project  
19 construction period allowed under the Contract, and measured those

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<sup>1</sup> Application, at 15 and 6.

<sup>2</sup> Application, at 8.

1 premiums relative to low sulfur diesel, since it appears highly likely that HECO  
2 will propose switching to that fuel by 2015 in order to comply with tightened  
3 regulations on emissions of sulfur dioxide. Next, I estimated several of the  
4 HBE Contract benefits, including its value as a hedge against higher than  
5 expected fossil fuel prices, and its contribution to reducing HECO's air  
6 emissions and its contribution to meeting HECO's targets under the  
7 Renewable Portfolio Standard ("RPS") law.

8  
9 Q. PLEASE SUMMARIZE THE RESULTS OF YOUR EVALUATION.

10 A. The results of my evaluation indicate that the Biofuel Supply Contract will  
11 enable HECO to provide reliable service at reasonable rates relative to  
12 continuing to rely upon fossil fuels. Specifically, the HBE Contract will:

- 13 • reduce the Company's dependence on fossil fuels at a cost that is  
14 either lower than, or a modest premium to, continued reliance on fossil  
15 fuels in the long-term;
- 16 • reduce customer exposure to increases in electricity costs from future  
17 fossil fuel prices that prove to be higher than expected;
- 18 • reduce HECO's emission of air pollutants;
- 19 • help HECO meet its RPS requirements; and
- 20 • leave HECO with the flexibility to acquire additional resources that  
21 prove to be cost-effective in the future.

1 Q. PLEASE SUMMARIZE YOUR CONCLUSION REGARDING THE  
2 PROPOSED BIOFUEL SUPPLY CONTRACT.

3 A. Based on the results of my evaluation, my conclusion is that the cost of biofuel  
4 under the proposed Biofuel Supply Contract is reasonable. The HBE Biofuel  
5 Supply Contract will enable HECO to provide reliable service at reasonable  
6 rates relative to continuing to rely upon fossil fuels.

7

8 **II. BACKGROUND.**

9 Q. PLEASE DESCRIBE THE STANDARD YOU USED TO EVALUATE  
10 WHETHER THE PROPOSED BIOFUEL SUPPLY CONTRACT IS IN THE  
11 PUBLIC INTEREST.

12 A. I used “reliable service at reasonable rates” as the standard to determine  
13 whether the proposed Biofuel Supply Contract is in the public interest. I chose  
14 that standard from a policy perspective because it is the basic obligation that  
15 HECO, like all utilities subject to the Commission’s jurisdiction, is required to  
16 meet. Since HECO is not acquiring these resources in order to ensure reliable  
17 service, I have focused solely on “reasonable rates.” Specifically I have  
18 focused on whether the HBE biofuel costs represent reasonable long-term  
19 energy costs for HECO.

1 Q. WHAT CRITERIA DID YOU USE TO EVALUATE WHETHER THE  
2 PROPOSED BIOFUEL SUPPLY CONTRACT WOULD MEET THAT  
3 STANDARD?

4 A. My evaluation examined whether the proposed contract which would enable  
5 HECO to satisfy Hawaii's various regulatory and public policy goals at a  
6 reasonable cost. The determination of what is reasonable often entails the  
7 exercise of judgment, especially when trying to satisfy several potentially  
8 conflicting objectives such as minimizing cost, reducing dependence on fossil  
9 fuels and reducing air emissions. The need for judgment is also required  
10 when dealing with the uncertainty associated with a 20 year contract, such as  
11 projections of future prices and probabilities of future pricing scenarios.

12 The Commission identified price premiums and corresponding values  
13 associated with the Biofuel Supply Contract as one of the eight issues in this  
14 Docket. Therefore, the first criterion I considered was the premium, i.e., the  
15 projected cost of the Biofuel Supply Contract relative to Reference Case  
16 forecasts for the fossil fuels being displaced by the HBE biofuel. Then I  
17 considered several potential offsetting criteria, i.e., the values corresponding to  
18 the Contract. These offsetting criteria relate to the regulatory goal of  
19 reasonable cost over time as well as Hawaii's policy goals of reducing its  
20 dependence on fossil fuel prices and fossil fuels in general, reducing air  
21 emissions to 1990 levels by 2020 and increasing the portion of its electricity  
22 needs met from renewable energy resources.

1 Q. PLEASE SUMMARIZE YOUR EVALUATION OF THE PROPOSED BIOFUEL  
2 SUPPLY CONTRACT.

3 A. My evaluation analyzed whether HECO's purchase of 10 million gallons of  
4 HBE biofuel per year would enable it to provide reliable service at reasonable  
5 rates as compared to continuing to purchase 10 million gallons of fossil fuels.  
6 First, I determined whether HECO would be paying a "premium" for biofuel  
7 under the HBE Contract relative to prices for the fossil fuels the HBE Contract  
8 would displace, and if so, the size and duration of that premium. That analysis  
9 focused on price premiums from 2017 onward, to reflect the project  
10 construction period allowed under the Contract, and measured those  
11 premiums relative to low sulfur diesel, since it appears highly likely that HECO  
12 will propose switching to that fuel by 2015 in order to comply with tightened  
13 regulations on emissions of sulfur dioxide. Next, I estimated several of the  
14 HBE Contract benefits, including its value as a hedge against higher than  
15 expected fossil fuel prices, its contribution to reducing HECO's air emissions  
16 and its contribution to meeting HECO's targets under the RPS law.

1 Q WHY ARE PRICE PREMIUMS AND CORRESPONDING VALUES  
2 TYPICALLY A KEY ISSUE IN THE EVALUATION OF LONG-TERM  
3 COMMITMENTS SUCH AS THE PROPOSED BIOFUEL SUPPLY  
4 CONTRACT?

5 A. Price premiums and corresponding values are typically a key issue in the  
6 evaluation of long-term contracts and major resource commitments proposed  
7 by regulated utilities because regulators do not want to approve transactions  
8 which may result in ratepayers paying costs that prove to be unreasonable  
9 over the duration of the contract or commitment. This cost risk arises because  
10 the future is uncertain, and while analyses can inform decisions, determining  
11 whether a specific commitment to incur costs for a long-term period ultimately  
12 requires the exercise of some degree of judgment.

13 For example, in May 2012, the Commission approved a contract  
14 between HECO and REG Marketing and Logistics Group, LLC ("REG") for a  
15 similar annual quantity of biodiesel as the Biofuel Supply Contract at a price  
16 premium to the fossil fuel the REG contract was displacing.<sup>3</sup> However, the  
17 REG contract has a 3 year term whereas the proposed Biofuel Supply  
18 Contract in the instant proceeding has a 20 year term. Thus, cost risk  
19 associated with the Biofuel Supply Contract arises from the uncertainty  
20 regarding the prices of alternative or substitute fuels, whether fossil or biofuel,

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<sup>3</sup> Order No. 30384, Docket No. 2011-0337 (filed on May 14, 2012).

1 that HECO would otherwise use at KPP over that 20 year term as well as from  
2 uncertainty regarding the potential availability of less expensive supplies of  
3 biofuels and other renewable resources over that term.

4  
5 Q. IS IT SURPRISING THAT THE PRICE OF A GIVEN FUEL UNDER A  
6 LONG-TERM CONTRACT MIGHT APPEAR TO HAVE A PREMIUM  
7 RELATIVE TO THE PRICE OF THAT SAME FUEL BOUGHT ON A SPOT  
8 BASIS?

9 A. Yes. It is important to appreciate that a fuel bought under a multi-year contract  
10 at an agreed upon pricing formula and the same fuel bought on a spot basis  
11 are not the same “products” in economic terms. The same quality fuel is being  
12 purchased and sold under both approaches, but the differences in the terms of  
13 the two transactions makes them different products. If HECO wanted to enter  
14 into a 10 year contract for LSFO at an agreed upon pricing formula, it is quite  
15 likely the resulting price would be quite different from the price it pays to  
16 purchase on a spot basis. Thus, one of the reasons why the price of biofuel  
17 under the proposed Biofuel Supply Contract may appear to be at a premium  
18 relative to forecasts of fossil fuels is simply the fact that they are different  
19 economic products. The question for this proceeding is whether any such  
20 price premium to ratepayers is justified by the incremental value of the  
21 Contract.



1    **III.    ANALYSIS OF PRICE PREMIUMS AND CORRESPONDING VALUES.**

2    Q.    PLEASE SUMMARIZE THE STEPS IN YOUR EVALUATION OF THE  
3        PROPOSED BIOFUEL SUPPLY CONTRACT.

4    A.    The first step in my evaluation was to identify the fossil fuels that the HBE  
5        biofuels would displace, and the forecast prices for those fossil fuels. Next, I  
6        determined whether HECO would be paying a “premium” for biofuel under the  
7        HBE Contract relative to the Reference Case price forecasts for those fossil  
8        fuels, and if so the size and duration of that premium. Finally, I estimated  
9        several of the HBE Contract benefits, including its value as a hedge against  
10       higher than expected fossil fuel prices, and its contribution to reducing HECO’s  
11       air emissions and its contribution to meeting HECO’s targets under the  
12       State’s RPS law.

13

14   Q.    HOW HAVE YOU ADDRESSED THE UNCERTAINTY IN YOUR  
15        EVALUATION OF THE REASONABLENESS OF THE PRICE PREMIUMS  
16        AND ASSOCIATED VALUES OF THE PROPOSED BIOFUEL SUPPLY  
17        CONTRACT?

18   A.    In general, my analysis addressed that uncertainty by assessing the proposed  
19        Biofuel Supply Contract in light of HECO’s obligation to provide reliable service  
20        at reasonable rates over the 20 year term of the proposed contract. I  
21        evaluated the proposed Biofuel Supply Contract within the context of HECO’s  
22        overall strategy for meeting its obligation and on the facts and analyses

1 currently available to its management and to the other parties as this point in  
2 time, which is when a decision has to be made. This is the approach I have  
3 used in other proceedings addressing proposals for similar long-term  
4 commitments such as long-term natural gas contracts and electric utility  
5 capacity acquisitions.

6  
7 Q. PLEASE DESCRIBE THE FOSSIL FUELS THE HBE BIOFUEL WOULD  
8 LIKELY DISPLACE AND THE FORECAST PRICES FOR THOSE FOSSIL  
9 FUELS.

10 A. The Company's application assumes that the HBE biofuel would displace  
11 LSFO and bases its price comparisons on a 2011 vintage forecast of  
12 LSFO prices. My analysis indicates that the HBE biofuel may displace LSFO  
13 but is more likely to displace low sulfur diesel, or ultra-low sulfur diesel. The  
14 HBE biofuel is more likely to displace low sulfur diesel because HECO must  
15 reduce its air emissions by 2015 and its most cost effective solution appears to  
16 be switching to ultra-low sulfur diesel.<sup>4</sup>

17 In addition, my review indicates that the price comparisons should be  
18 based on 2012 vintage forecasts from the HECO Integrated Resource  
19 Plan ("IRP"). Every year, the United States Energy Information Administration  
20 produces an Annual Energy Outlook ("AEO") with long-term forecasts of fossil

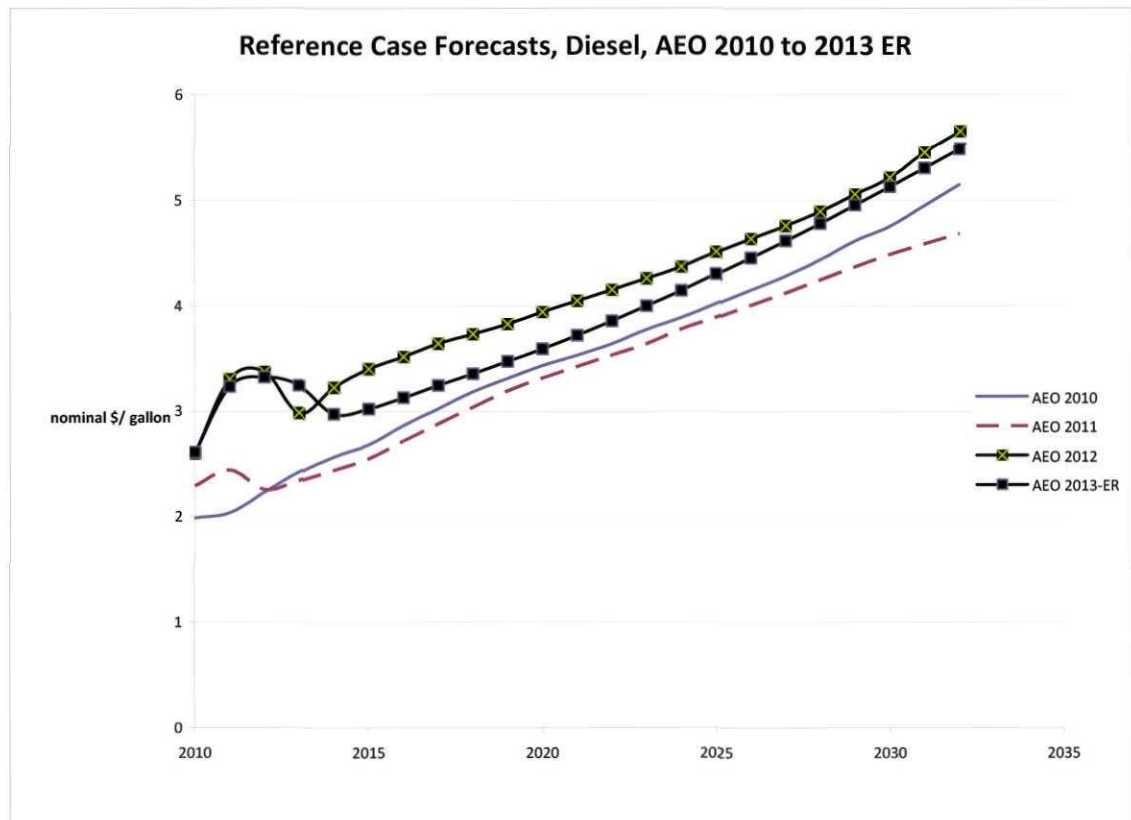
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<sup>4</sup> My price projections use prices for low sulfur diesel, but the conclusions I reach are valid since the prices for low sulfur diesel are close to those for ultra-low sulfur diesel.

1 fuel prices. The most recent AEO for which there is a full report is  
2 the 2012 AEO.

3 As indicated in CA-201, the AEO long-term forecasts for low sulfur  
4 diesel and for LSFO have generally been increasing since 2010. In particular,  
5 the 2012 forecasts are higher than the 2011 forecasts. This indicates that the  
6 price premium of the biofuels will be lower when measured relative to  
7 the 2012 low sulfur diesel forecast than when measured relative to the 2011  
8 or 2012 LSFO forecasts.

9



1 Q. PLEASE SUMMARIZE THE PRICING FORMULA FOR BIOFUEL UNDER  
2 THE PROPOSED CONTRACT.

3 A. The price that HECO would pay for the biofuel is set by [REDACTED]  
4 [REDACTED]  
5 [REDACTED]  
6 [REDACTED]  
7 [REDACTED]  
8 [REDACTED]  
9 [REDACTED]  
10 [REDACTED]  
11 [REDACTED]  
12 [REDACTED]  
13 [REDACTED]

14  
15 **A. ENERGY COSTS UNDER HBE CONTRACT VERSUS FOSSIL**  
16 **FUELS AT REFERENCE CASE PRICES.**  
17

18 Q. PLEASE SUMMARIZE THE COMPANY'S PROJECTION OF HBE BIOFUEL  
19 PRICES RELATIVE TO THE FOSSIL FUELS IT WOULD DISPLACE.

20 A. The Company provides a projection of HBE biofuel prices (nominal \$/gallon) at  
21 [REDACTED] in Figure 5 on page 19 of Exhibit E of its application.  
22 That Figure provides a retrospective estimate for 2000 through 2011 and a  
23 prospective projection for 2012 through 2035. In that Figure, the Company

1 also provides its 2011 vintage forecast of LSFO prices for a Reference Case  
2 and a High Case.

3

4 Q. PLEASE DESCRIBE YOUR INITIAL COMPARISONS OF THE PRICE PER  
5 GALLON OF THE HBE BIOFUEL RELATIVE TO THE FOSSIL FUELS IT  
6 WOULD DISPLACE.

7 A. My analysis began with the Company's projection of biofuel prices and  
8 its 2011 LSFO forecast of Reference Case and High Case prices for the  
9 period 2012 through 2035. The Company's projection for that period is  
10 presented in CA-202, with the biofuel prices in solid lines and the 2011 LSFO  
11 forecasts in lines with square markers.

12 I then updated that comparison using the 2012 LSFO forecast from  
13 HECO's IRP. As shown in CA-203, the 2012 LSFO forecast, in lines with  
14 triangles, is higher than the 2011 forecast for both the Reference and the High  
15 Cases. This indicates that the price premium of the biofuels is lower when  
16 measured relative to the 2012 LSFO forecast than when measured relative to  
17 the 2011 LSFO forecast per Figure 5 of Exhibit E of the Company's  
18 application.

19 Finally, I prepared a comparison using the 2012 low sulfur diesel  
20 forecast from HECO's IRP. As shown in CA-204, the 2012 low sulfur diesel  
21 forecast, in lines with diamonds, is higher than the 2012 and  
22 the 2011 forecasts of LSFO. This indicates that the price premium of the

1 biofuels is lower when measured relative to the 2012 low sulfur diesel forecast  
2 than when measured relative to the 2011 or 2012 LSFO forecasts.

3  
4 Q. PLEASE SUMMARIZE THE RESULTS OF YOUR ANALYSES OF BIOFUEL  
5 PRICE PREMIUMS RELATIVE TO LOW SULFUR DIESEL.

6 A. My analyses indicates that, on a net present value (“npv”) basis, the price of  
7 HBE biofuel would be less than that of low sulfur fuel at both the [REDACTED]  
8 [REDACTED] of HECO’s forecast. Biofuel prices at the [REDACTED] of  
9 HECO’s forecast would be less, on average, than the Reference Case  
10 forecast of low sulfur diesel over the period, [REDACTED]  
11 [REDACTED] per CA-206, while those at the [REDACTED]  
12 of HECO’s forecast would be higher for a number of years but lower on an npv  
13 basis. [REDACTED]  
14 [REDACTED]. In other words, on an  
15 npv basis, biofuel would produce savings relative to low sulfur diesel.

16  
17 **B. VALUE AS A HEDGE.**

18 Q. WHAT IS THE BASIC VALUE TO CUSTOMERS OF A UTILITY  
19 DIVERSIFYING ITS SUPPLY PORTFOLIO?

20 A. The basic value of diversifying a supply portfolio is to reduce the utility’s  
21 exposure to future events or market trends that may have a low probability but  
22 a high cost to customers.

1 Q. IS IT REASONABLE TO EXPECT THAT THE HBE BIOFUELS WILL  
2 REDUCE HECO'S EXPOSURE TO INCREASES IN ELECTRICITY COSTS  
3 DUE TO HIGHER THAN EXPECTED FOSSIL FUEL PRICES?

4 A. Yes. My analysis estimated the cost mitigation value of the biofuel relative to  
5 the High Case forecasts for the displaced fossil fuels from HECO's 2013 IRP,  
6 again using cost per gallon and cost per megawatt-hour ("MWh"). That  
7 analysis indicates that biofuel prices would be materially less on average than  
8 the High Case forecasts for both LSFO and low sulfur diesel over the  
9 period 2017 to 2032. [REDACTED]

10 [REDACTED]  
11 [REDACTED]. That comparison is  
12 presented on pages 3 and 4 of CA-206.

13

14 **C. REDUCTION IN AIR EMISSIONS.**

15 Q. IS IT REASONABLE TO EXPECT THAT THE HBE BIOFUELS WILL  
16 REDUCE HECO'S EMISSIONS OF AIR POLLUTANTS?

17 A. Yes. Initial biofuel test results from Kahe 3 have been provided in  
18 Docket No. 2009-0155, demonstrating SO<sub>2</sub> emissions reductions of 94%, and  
19 small reductions in NO<sub>x</sub> emissions. CO<sub>2</sub> emissions reductions from biofuels  
20 are difficult to assess; historically, some have considered biofuels to be  
21 "CO<sub>2</sub> neutral" fuels with zero emissions. This is not accurate due to emissions  
22 associated with harvest, processing, transport, and changes in land use

1 patterns. The HBE process, using plants grown on former sugarcane land and  
2 a conversion facility powered largely by electricity produced as a byproduct of  
3 the production of biofuels, is very efficient. A life cycle analysis of the project  
4 was prepared by an independent consultant and found at least  
5 a 66% reduction in emissions compared to LSFO (see CA-SIR-12).

6  
7 **D. RPS REQUIREMENTS.**

8 Q. WILL THE HBE BIOFUELS HELP HECO MEET ITS RPS REQUIREMENTS?

9 A. Yes. As indicated in CA-207, in 2017, the projected cost per MWh of  
10 electricity from HBE would be lower if contract arrangements could be made to  
11 use an HBE/LSFO blend at the Kalaeloa station, which has a lower heat rate  
12 than Kahe Unit 3.

13 Per CA-IR-1, HBE biofuels would increase the consolidated RPS of the  
14 Companies by 1.5% based on 2011 sales. The 2020 contribution would range  
15 from 1.1-1.7% based on the sales forecast.

16  
17 **E. FLEXIBILITY.**

18 Q. WILL THE BIOFUEL SUPPLY CONTRACT ALLOW HECO THE FLEXIBILITY  
19 TO PURCHASE OTHER COST-EFFECTIVE SUPPLIES IN THE FUTURE?

20 A. Yes. The proposed contract will leave HECO with the flexibility to acquire  
21 additional resources that prove to be cost-effective in the future. The Contract  
22 will not prevent the Company from acquiring biofuels and renewable resources



1 from other sources over the course of the Contract since the quantity of  
2 biofuels HECO would procure under this Contract is relatively nominal and  
3 would not force HECO to curtail or otherwise dispatch KPP utilizing the biofuel  
4 in order to comply with the contracted volume.

5  
6 **IV. CONCLUSION.**

7 Q. PLEASE SUMMARIZE YOUR CONCLUSION REGARDING THE COST OF  
8 BIOFUEL UNDER THE PROPOSED BIOFUEL SUPPLY CONTRACT.

9 A. My conclusion is that the cost of biofuel under the proposed Biofuel Supply  
10 Contract is reasonable. This conclusion is based on the results of my analysis  
11 of the price premiums and values associated with the Contract.

12  
13 Q. PLEASE COMMENT ON THE COMPANY'S ESTIMATE OF THE RATE  
14 IMPACT OF THIS CONTRACT.

15 A. The Company's application presents an illustration of the impact that HBE  
16 biofuel costs would have had on residential customers had the Contract been  
17 in effect in 2011 and had the biofuels been displacing LSFO gallon for gallon.  
18 Based on those assumptions, the illustrative impact is \$1.19 per month. My  
19 analysis, presented in CA-208, indicates that any impact is likely to be much  
20 lower, in the range of \$0.20/month to \$0.78/month, particularly since the  
21 biofuel will most likely displace low sulfur diesel. In addition, the timing of any  
22 impact is a few years away. The Company is unlikely to acquire material

1 quantities of biofuels from HBE until 2017. Any bill impacts after the first year  
2 of the HBE Contract are likely to be even lower, as indicated by the gradual;  
3 decline in premiums show on page 1 of CA-206.

4

5 Q. DOES THIS CONCLUDE YOUR WRITTEN TESTIMONY?

6 A. Yes.

## **James Richard Hornby**

**Senior Consultant**

**Synapse Energy Economics, Inc.**

**485 Massachusetts Ave., Suite 2, Cambridge, MA 02139**

**(617) 453-7043 • fax: (617) 661-0599**

**www.synapse-energy.com**

**rhornby@synapse-energy.com**

### **PROFESSIONAL EXPERIENCE**

**Synapse Energy Economics, Inc.**, Cambridge, MA.

*Senior Consultant*, 2006 to present.

Provides analysis and expert testimony regarding planning, market structure, ratemaking and supply contracting issues in the electricity and natural gas industries. Planning cases include evaluation of resource options for meeting tighter air emission standards (e.g. retrofit vs. retire coal units) in Kentucky, West Virginia and U.S. Midwest as well as development of long-term projections of avoided costs of electricity and natural gas in New England. Ratemaking cases include electric utility load retention rate in NS, various gas utility rate cases and evaluation of proposals for advanced metering infrastructure (smart grid or AMI) and dynamic pricing in MD, PA, NJ, AR, ME, NV, DC and IL.

**Charles River Associates (formerly Tabors Caramanis & Associates)**, Cambridge, MA.

*Principal*, 2004-2006, *Senior Consultant*, 1998–2004.

Expert testimony and litigation support in energy contract price arbitration proceedings and various ratemaking proceedings. Productivity improvement project for electric distribution companies in Abu Dhabi. Analyzed market structure and contracting issues in wholesale electricity markets.

**Tellus Institute**, Boston, MA.

*Vice President and Director of Energy Group*, 1997–1998.

*Manager of Natural Gas Program*, 1986–1997.

Presented expert testimony on rates for unbundled retail services, analyzed the options for purchasing electricity and gas in deregulated markets, prepared testimony and reports on a range of gas industry issues including market structure, strategic planning, market analyses, and supply planning.

**Nova Scotia Department of Mines and Energy**, Halifax, Canada.

*Member*, Canada-Nova Scotia Offshore Oil and Gas Board, 1983–1986.

*Assistant Deputy Minister of Energy* 1983–1986.

*Director of Energy Resources* 1982-1983.

*Assistant to the Deputy Minister* 1981-1982.

**Nova Scotia Research Foundation**, Dartmouth, Canada, *Consultant*, 1978–1981.

**Canadian Keyes Fibre**, Hantsport, Canada, *Project Engineer*, 1975–1977.

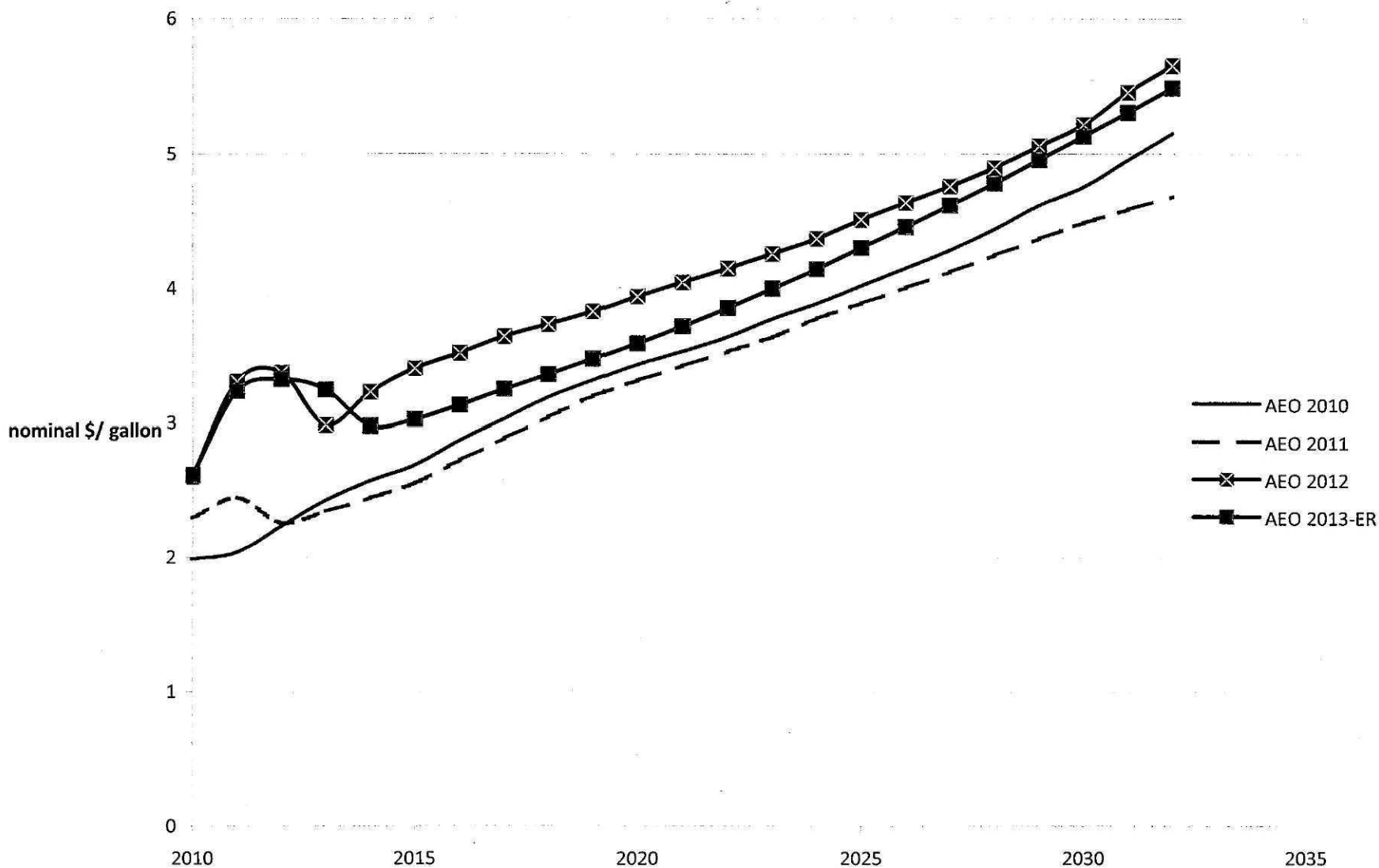
**Imperial Group Limited**, Bristol, England, *Management Consultant*, 1973–1975.

#### **EDUCATION**

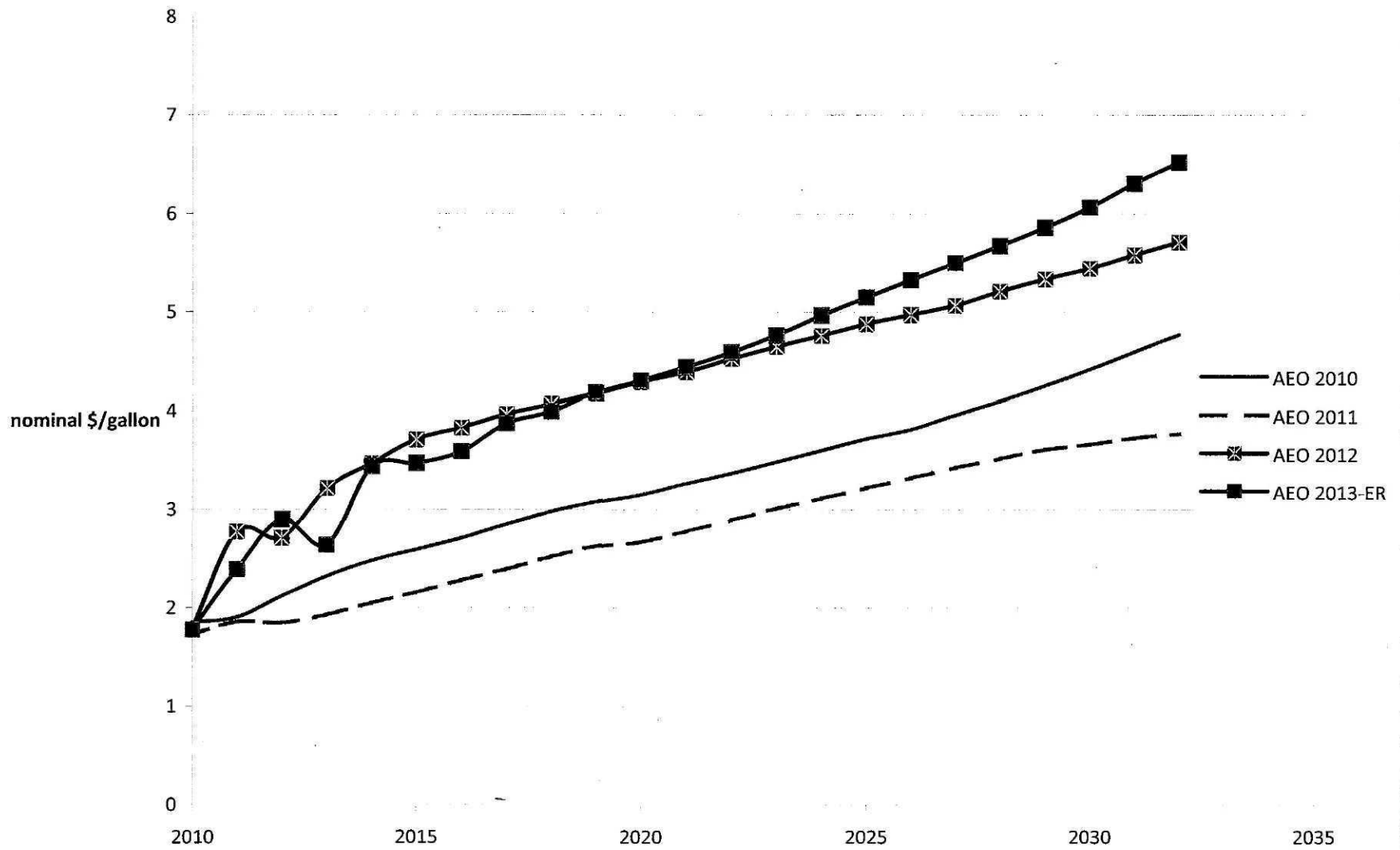
M.S., Technology and Policy (Energy), Massachusetts Institute of Technology, 1979.

B.Eng., Industrial Engineering (with Distinction), Dalhousie University, Canada, 1973.

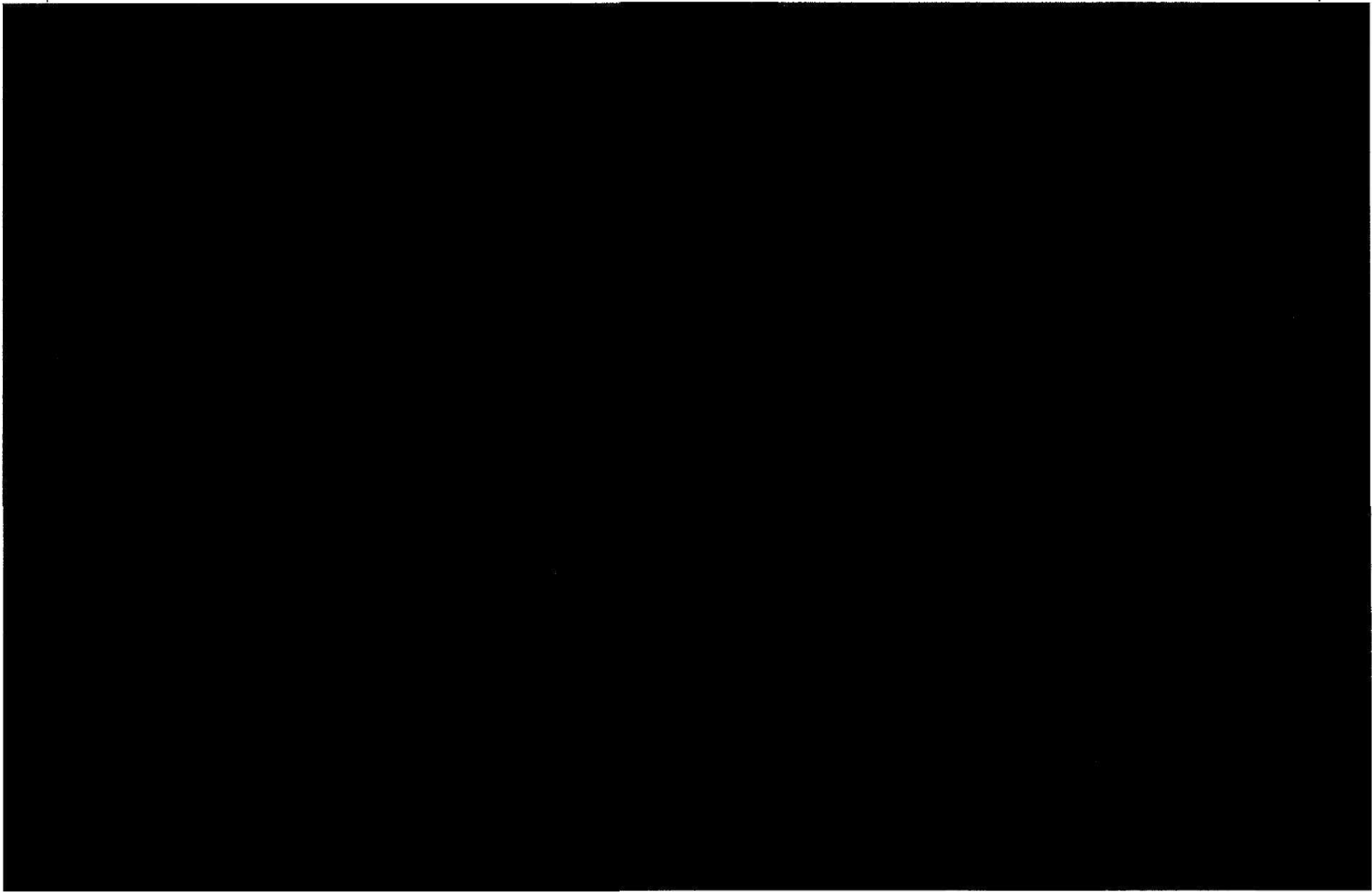
### Reference Case Forecasts, Diesel, AEO 2010 to 2013 ER



### Reference Case Forecasts, LSFO, AEO 2010 to 2013 ER



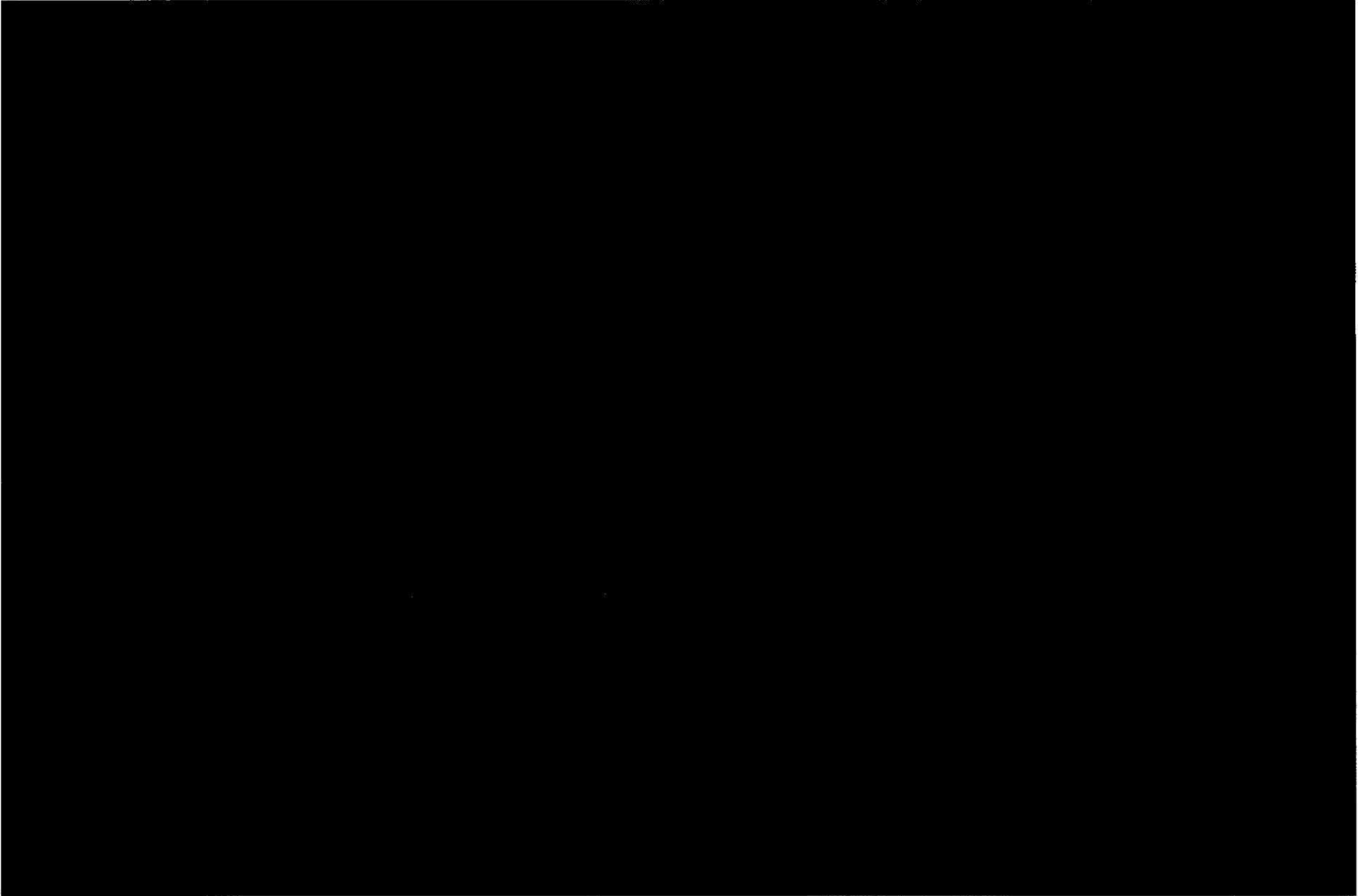
**Forecast HBE biofuel price range vs 2011 vintage LSFO price forecasts**



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**Forecast HBE biofuel price range vs 2012 vintage LSFO price forecasts**

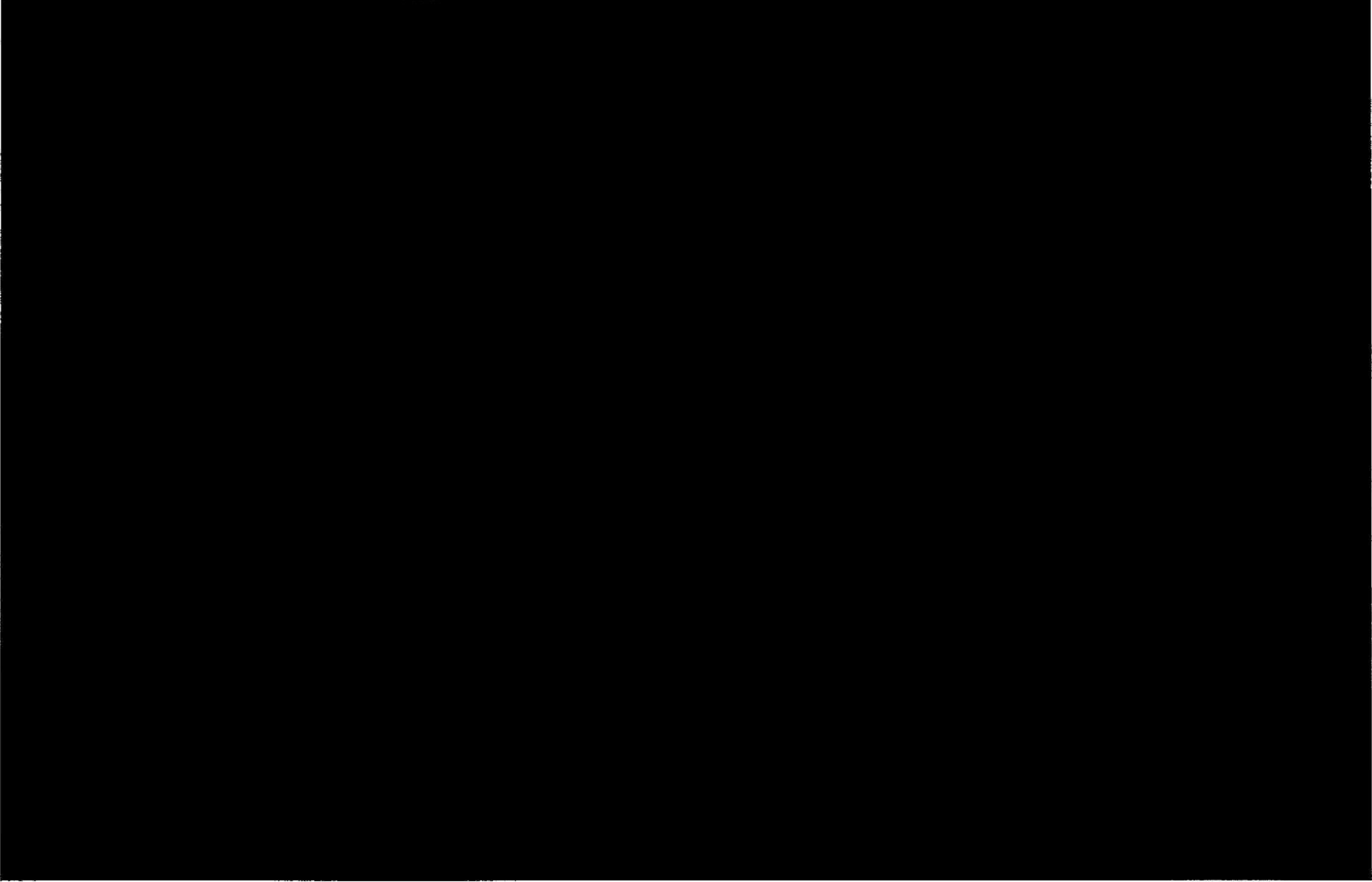


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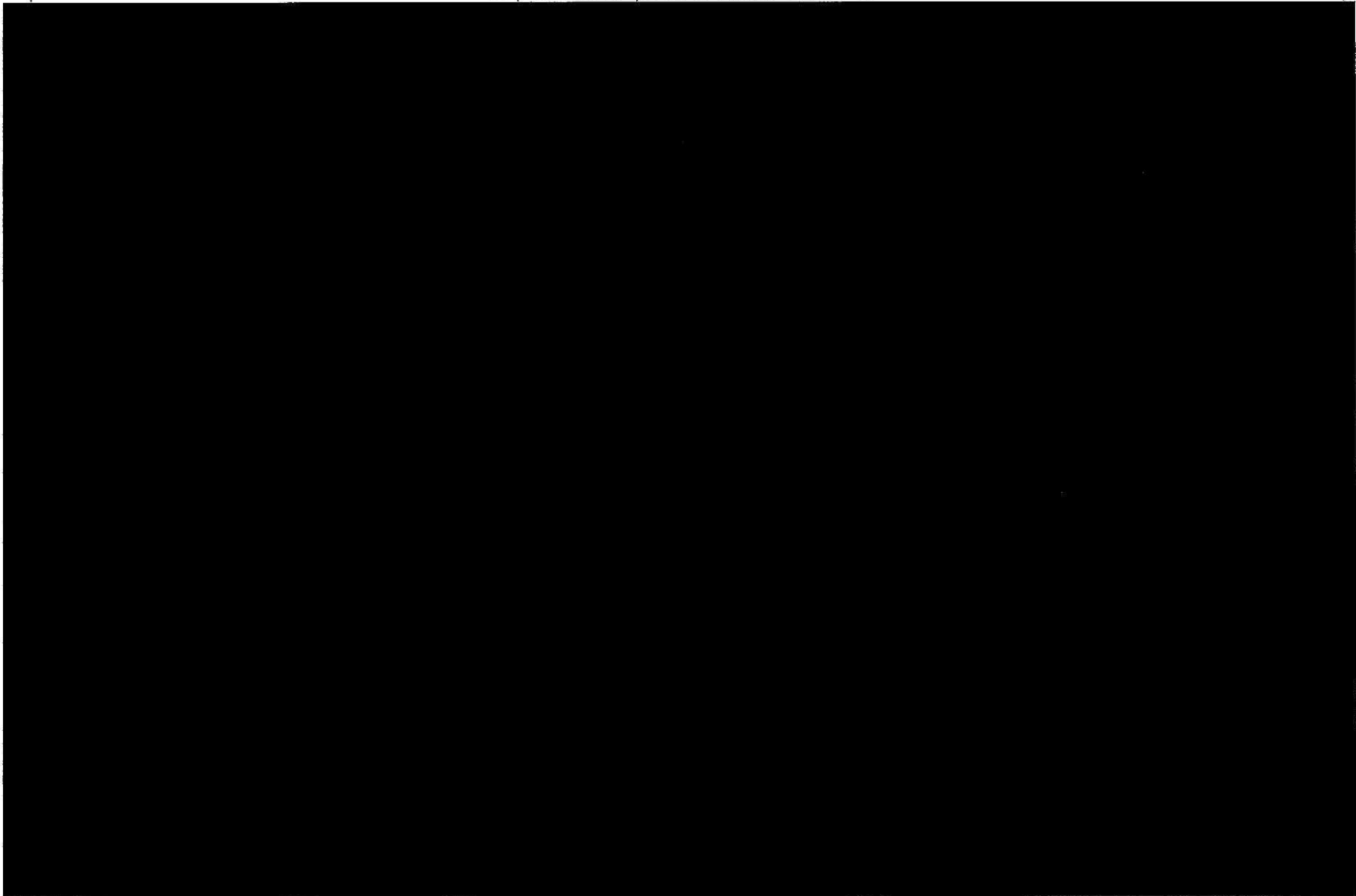
**Forecast HBE biofuel price range vs 2012 low sulfur Diesel price forecasts**



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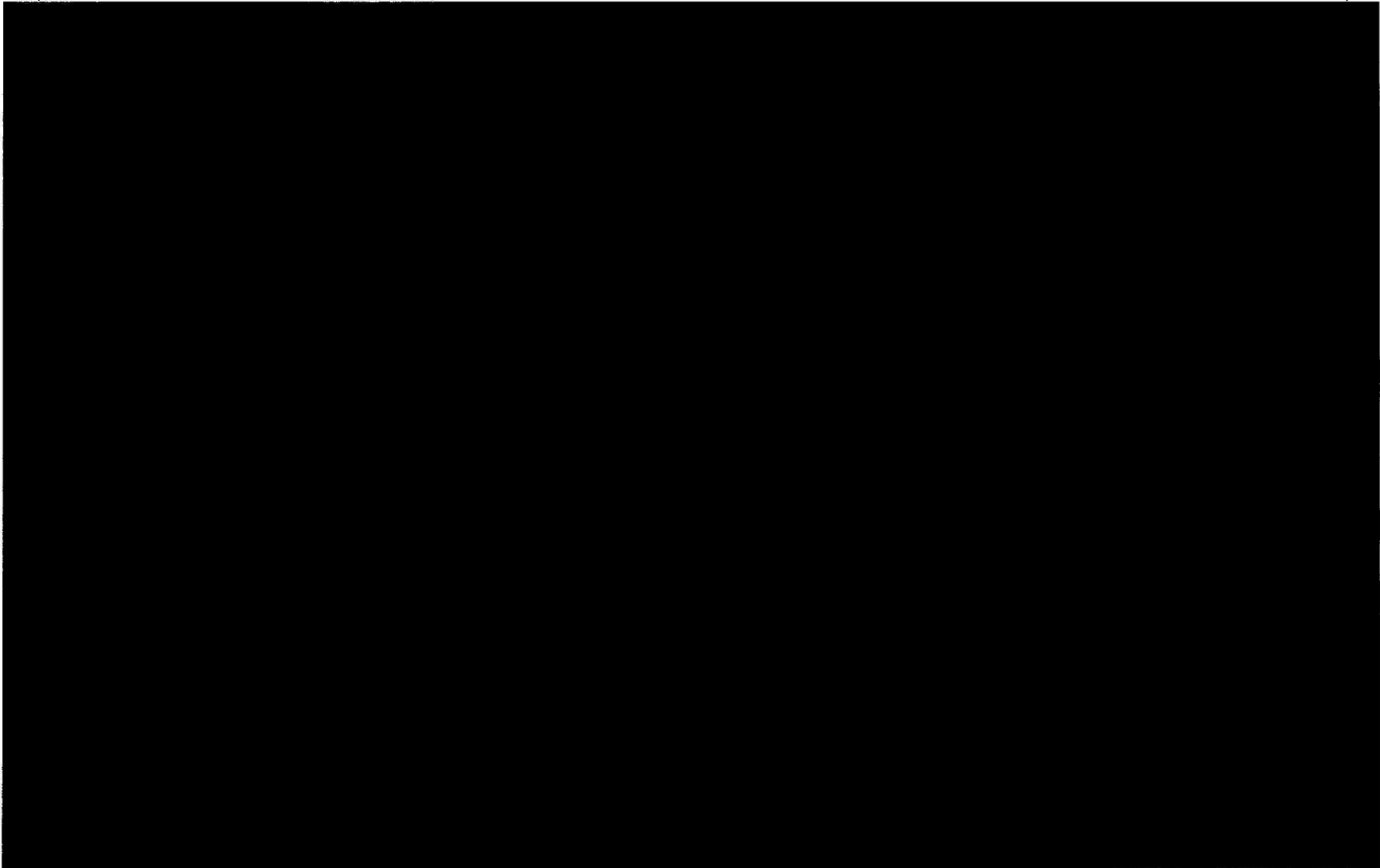
**Illustrative costs of generation (\$/MWh) in 2017 from HBE / LSFO blend,  
LSFO and Low Sulfur Diesel**



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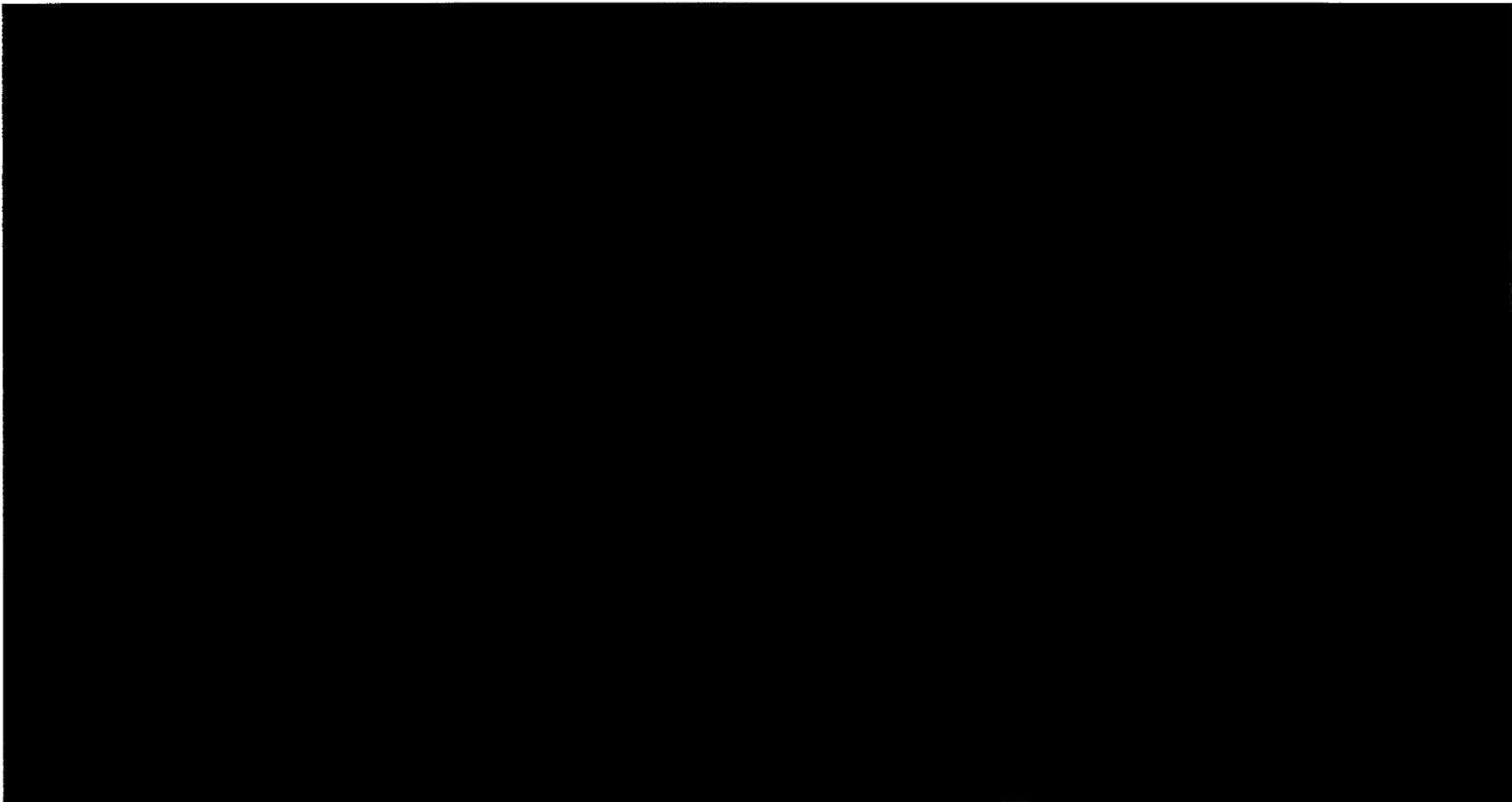
**HBE biofuel premiums relative to Reference Case price of low sulfur diesel and electric energy produced from low sulfur diesel**



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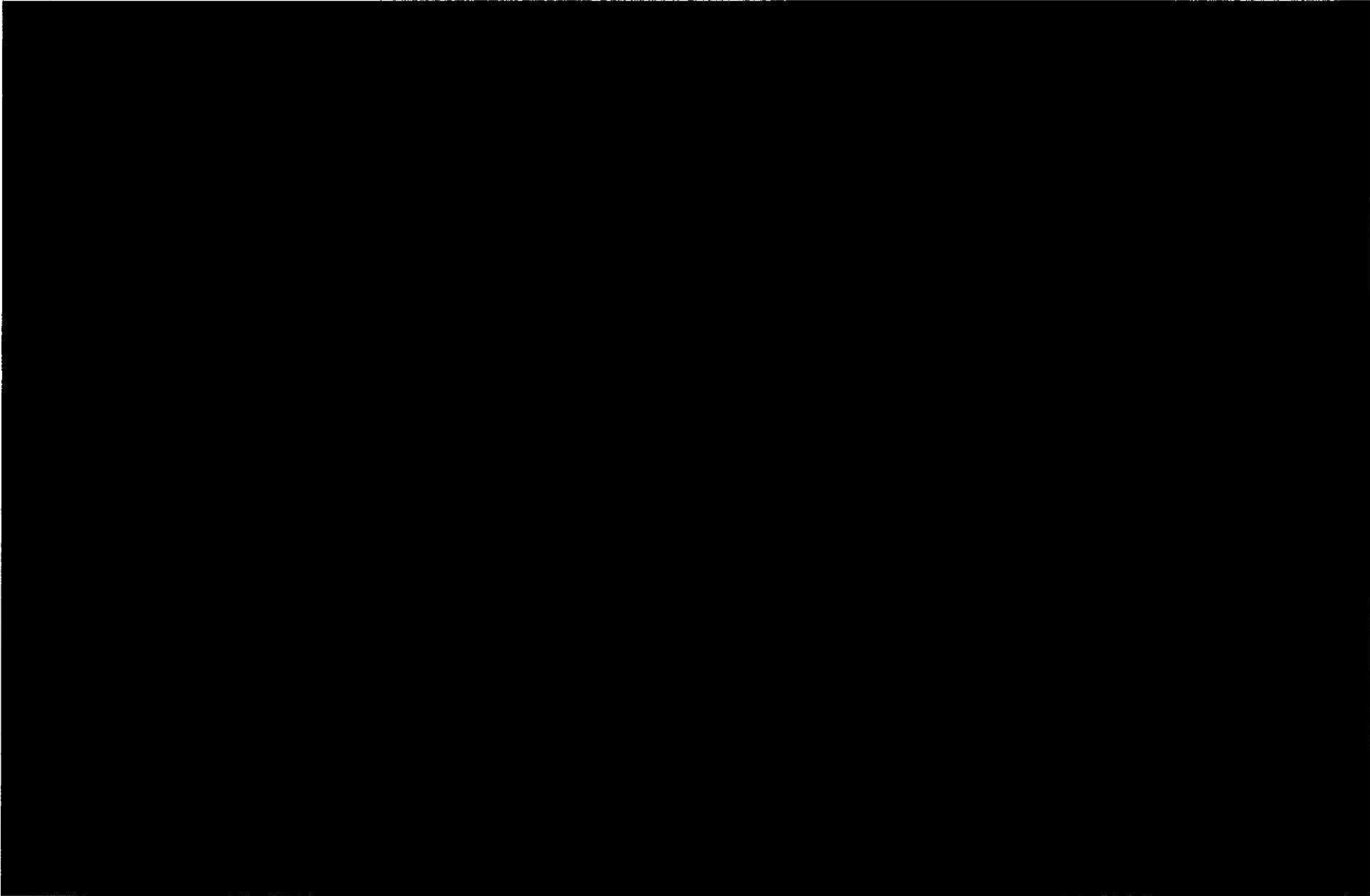
**Annual Cost Premiums of HBE biofuels versus LSFO and Low Sulfur Diesel**



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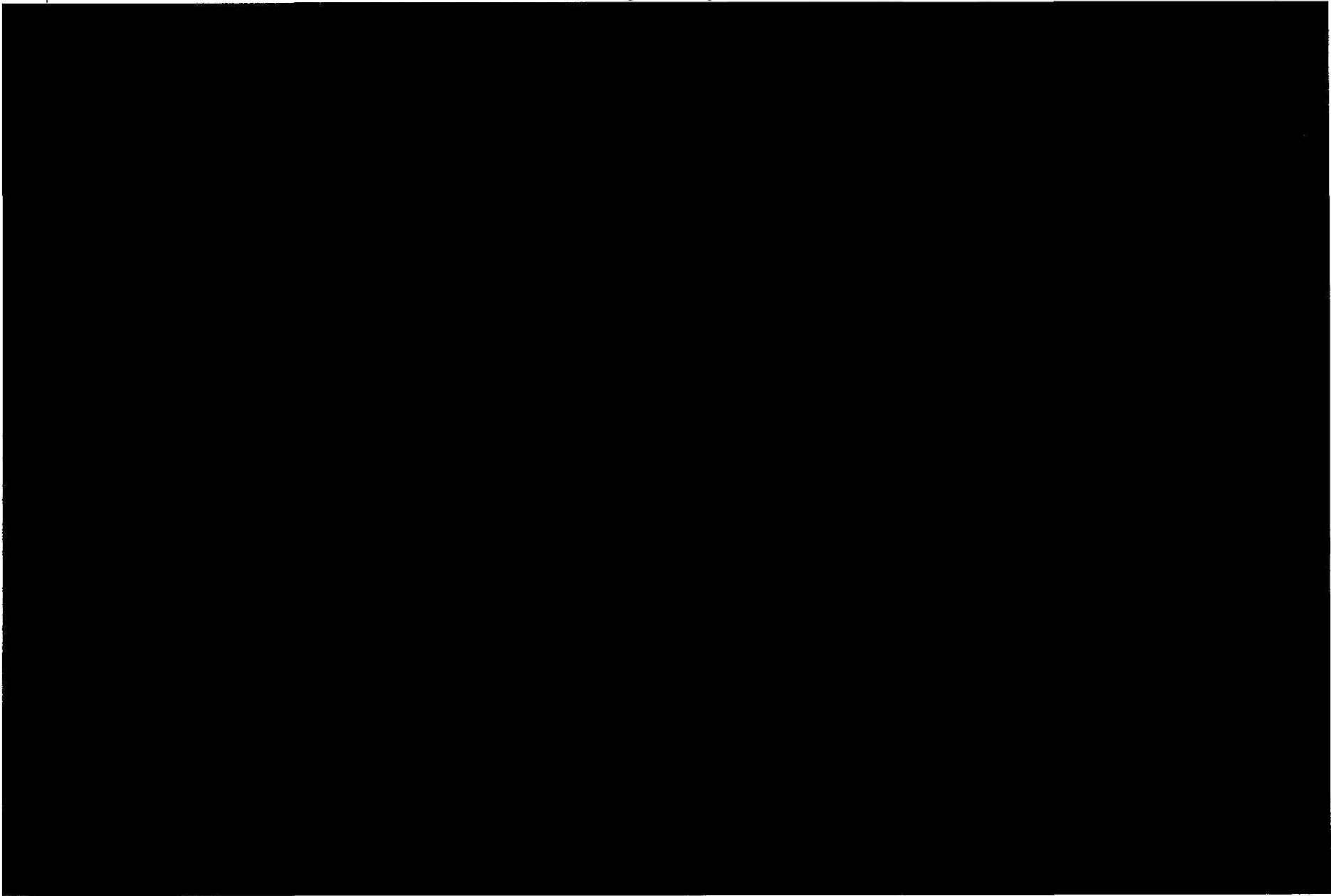
**HBE biofuel premiums relative to High Case price of low sulfur diesel  
and electric energy produced from low sulfur diesel**



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**2017 Cost of Electricity compared to Renewables**



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**CONFIDENTIAL SUBJECT TO PROTECTIVE ORDER**

**Illustration of HBE Residential Bill Impacts at Various Levels of Fuel Price Premium**

