Filed with the Iowa Utilities Board on October 25, 2016, EEP-2013-0001

STATE OF IOWA
DEPARTMENT OF COMMERCE
BEFORE THE IOWA UTILITIES BOARD

IN RE: INTERSTATE POWER AND LIGHT COMPANY, MIDAMERICAN ENERGY COMPANY, and BLACK HILLS/IOWA GAS UTILITY COMPANY, LLC, d/b/a BLACK HILLS ENERGY	DOCKET NOS. EEP-2012-0001 EEP-2012-0002 & EEP-2013-0001

NET-TO-GROSS PLAN STATUS REPORT

The Net-to-Gross Plan filed on September 1, 2016, indicated that a copy of the detailed work plan of research to be done by Dunsky Energy Consulting ("Dunsky") as part of the joint assessment of potential would be filed by October 15, 2016. On October 14, 2016, the Office of Consumer Advocate ("OCA"), in consultation with Net-To-Gross Oversight Committee, which includes Interstate Power and Light Company, Black Hills Energy, MidAmerican Energy Company, the Iowa Environmental Council, and the Environmental Law and Policy Center, reported that the Oversight Committee was in the process of reviewing a draft of the detailed work plan and would be able to provide that plan to the Board by October 25, 2016. OCA hereby submits the work plan for the assessment of potential study to be conducted by Dunsky (Attachment A). Net-to-gross research is specifically addressed at pages 4 and 15-18, and is also

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referenced throughout the document as part of the overall work plan.

Respectfully submitted,

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OFFICE OF CONSUMER ADVOCATE

IOWA GAS AND ELECTRICITY POTENTIAL STUDY

WORK PLAN

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IOWA GAS AND ELECTRICITY POTENTIAL STUDY: WORK PLAN

1. Introduction

The Dunsky Team (comprised of Dunsky Energy Consulting, Opinion Dynamics and Michaels Energy) is performing an Gas and Electricity Potential Study for the state of Iowa that will cover the period of 2018-2027, forecasting reference energy using the baseline year (2015-16) as a starting point.

This work plan provides a general overview of the key tasks and activities that will be undertaken toward producing the Gas and Electricity Potential Study by the July 2016 deadline, including key milestones, filing deadlines, and deliverables. Descriptions of the follow key items are found within the document: The Dunsky Team members, primary data collection, model approach, the project timeline, key deliverables, meetings, and decision points, and regulatory (Chapter 35) requirements. The work plan contains a summary of this information within the main body and with detailed supplemental information Appendices.

2. The Dunsky Team

The Dunsky Team consists of nine core members from three organizations, Dunsky Energy Consulting (DUNSKY), Opinion Dynamics Corporation (ODC) and Michaels Energy (Michaels). The members are as follows:

Name	Company	Role	Email Contact
Alex Hill	DUNSKY	Project Manager / Financing Expert	alex.hill@dunsky.com
Antje Flanders	ODC	Net-to-Gross Study Lead	aflanders@opiniondynamics.com
Bryce Dvorak	Michaels	Commercial / Institutional Sector Lead	BJD@MichaelsEnergy.com
David Baumann	DUNSKY	Project Coordinator / Assistant Modeler	david.baumann@dunsky.com
Francois Boulanger	DUNSKY	Residential Sector Lead	francois.boulanger@dunsky.com
Jake Millette	ODC	Baseline Study Lead	jmillette@opiniondynamics.com
Julie A Blackwell	Michaels	Regulatory Expert	jablackwell@MichaelsEnergy.com
Martin Poirier	DUNSKY	Lead Modeler	martin.poirier@dunsky.com
Mike Frischmann	Michaels	Industrial Sector /Onsite Data Collection Lead	MTF@MichaelsEnergy.com

3. Key Potential Study Elements

The following are high level descriptions of the key methodological elements of the Potential Study. See Appendix 1 for a more in-depth description of the methodology.

3.1. Baseline Survey

To determine the potential of future energy efficiency programs, a baseline must be determined for each utility as is possible. The Dunsky Team will consider all the available data sources, and will complement these with primary research and/or data from secondary sources where needed. The baseline will be disaggregated by utility, by sector and sub-sector, and by key end-use.

3.2. NTG

The net-to-gross (NTG) assessment of key programs in the utilities' portfolios of efficiency programs will play an important role to inform the estimation of potential. As outlined in the *Iowa Energy-Efficiency Net-to-Gross Report,* evaluators use a variety of approaches to quantify program influence and establish the counter-factual; that is, to determine what would have happened in the absence of program efforts. Based on our review of programs and their contribution to portfolio savings – and with agreement by the utilities and the IUA – we will conduct primary research to develop utility and program-specific NTG ratios for three key programs, conduct secondary research to develop program-specific NTG ratios for an additional seven programs, and use a combination of existing and deemed values for the remainder of the programs.

3.3. Potential Assessment

3.3.1. Measure Characterization and Qualitative Screening

The Dunsky Team will review the measures included in the forthcoming Iowa Technical Reference Manual (TRM) and develop a database of electricity and natural gas energy efficiency measures to be included in the study. The TRM provides a comprehensive list of both residential and C&I measures, and will define a majority of the measures included in the potential model. Using the assumptions from the TRM, we will be able to characterize all of the measures outlined in the TRM. Our team also included a list of 12 additional residential measures and 23 additional commercial measures outside of the TRM which we will characterize as part of the study. These measures will rely on data collected during the site visits in order to properly quantify the appropriate parameters such as size, efficiency, age, and operation. Additionally, Michaels Energy has a detailed database of more than 5000 custom projects completed in Iowa going back more than 5 years and has access to previous custom projects that have been evaluated in Iowa as well. Both of these sources will be used to further refine the characterization of individual measures included in the potential model. Finally, the historical custom data will provide our team with actual examples of measures completed which are not included in the TRM. This will play an important role in estimating other custom potential that might be available in C&I facilities.

3.3.2. Program Characterization

A set of best-in-class program archetypes will be developed based on our Team's experience, best practices, discussion with the IUA, and knowledge of existing DSM programs in Iowa (as well as similar regions). Program archetypes will be designed to capture all special programs defined in Chapter 35, including low-income programs, cost-effective assistance to homebuilders and homebuyers, and tree planting. In addition, optional financing programs will be built into the analysis and included in the sensitivity options. Financing efforts will be designed to cover such options as residential and commercial PACE, public building financing, and on-bill financing (OBF) or -recovery (OBR). Program characterization will produce a set of program-level assumptions (general administration costs, incentive levels, uptake) and measure-to-program mapping, which will serve as inputs to our model. High-level results will be reported by program archetype.

3.3.3. Potential Scenarios

Technical and Economic Potential deliverables include the assessed energy efficiency and demand response potentials by energy source, utility, sector, sub-sector (segment), and end-use, for each year in the forecast (2018-2027), as well as a discussion of results and comparative assessment of the results with previous potential assessment studies in Iowa and similar jurisdictions. Economic potential is determined by screening technical potential measures – or bundles of measures – against standard cost-effectiveness tests. It disregards market barriers to adoption. Our potential model calculates two types of cost-effectiveness ratios. The Societal Cost Test (SCT) is used to screen measures for the Economic and Achievable potentials, while the Participant Cost test (PCT) is an input (among others) for measure adoption rates.

Achievable Potential can be defined as the amount of energy savings that can be achieved, assuming the aggressive programs are implemented with no budget constraints other than SCT-driven cost-effectiveness requirements. Our user-friendly model will produce an upper-bound "maximum" savings scenario, taking into consideration realistic market penetration rates over the study period. Dunsky has developed a sophisticated adoption model which bases adoption on a combination of customer cost-effectiveness – applied differently for each sector – and levels of market barriers.

The Dunsky model introduces competition groups at the achievable potential level. Multiple measures that compete with each other for the same market can be selected if they are all cost-effective. In that case, each measure is attributed a share of the overall market based on its base adoption rate compared to other measures. Our model also dynamically accounts for cumulative effects of "chained measures". For example, if insulation is added in a given building, savings from an efficient furnace installed afterwards in the same building will be reduced (as less heat is needed to meet the building's heating requirements). Based on user input, the model automatically calculates these cumulative effects according to measure screening and uptake under a given scenario. Interactions between electricity and gas programs are also considered, in order to assess how program delivery may impact not only adoption rates, but also other potential effects such as program administration costs per participant.

We will provide the IUA with a detailed analysis of an "upper-bound" scenario, i.e. maximum achievable savings from aggressive implementation of best-in-class programs. Our model is built from the ground up to provide full flexibility in assessing multiple scenarios and sensitivities. Alternative scenarios will be produced and included in the final report. In addition, we will provide the IUA with a licensed copy of the model – as well as associated training – that will allow changes to key parameters, testing of key assumptions, and creation of boundless scenario and sensitivity analyses, without the need for additional support.

3.4. Financing Memo

The IUA has highlighted the potential impact of financing on the adoption of energy efficiency measures for specific treatment in the potential study. In order to inform the treatment of financing programs within the potential model, we will prepare a memo highlighting how financing may impact measure adoption considering its interactions with incentive programs, its ability to lower uptake barriers, and its specific role or impact in each modeled sector, and varied impact on specific measure classes. The memo will examine these impacts for a range of efficiency financing options and program models, including On-bill repayment

(OBR), Property Assessed Clean Energy (PACE), secured and unsecure bank and credit union loans, equipment leases, and other relevant other tools.

The memo will outline the methodology for including financing program effects in the model, and will provide the IUA and its members with the opportunity to review and give feedback on our approach. Ultimately, this will allow the model to test scenarios with and without financing impacts, and for various levels of financing program support.

3.5. Regulatory Considerations and Support

The Iowa Administrative Code, Chapter 35, defines the requirements and timelines for potential assessment and plan. The assessment will take into account all requirements listed in Chapter 35 and how these interact with each Utilities' filing schedule and deadlines. We have then backed out the key deadlines to ensure that the Potential Study deliverables and interim reporting meet the Chapter 35 requirements and have highlighted any potential scheduling and reporting issues.

For example, program archetypes will be designed to capture all special programs defined in Chapter 35, including low-income programs, cost-effective assistance to homebuilders and homebuyers, and tree planting. In addition, the Dunsky Team has structured its work plan to ensure that the assessment timeline conforms with the interim and final filing dates for each utility.

4. Detailed Project Timeline

M Formal meetings with IUA | D Deliverables due | IUA IUA to provide feedback / information

* = in-person or webinar meeting ** = The Dunsky Team will provide support for EE Plan vendor

	Task	Activity	Sep		Oct		Nov		Dec		Jan		Feb		Mar		Apr		May		Jun		Jul		Aug	
			Timing of task and deliverables																							
Set-up	1.1 Kick-Off	Kick-off meeting	M																							
	1.2 Work Plan	Draft and Finalize Work Plans with respect to Chapter 35 section 8				D																				
	1.3 Project management	Monthly status updates with IOU / IUA representative(s) - telephone	M		M*		M		M		M			M*			M*		M*			M*		M*	M*	
Chapter 35 requirements	1.4 Major Events (Deliverables, Meetings, Filings)	Meeting: Draft Report + Stakeholder input																	M							
		Draft Written Notification + Utility Approval **																			D					
		IUB Approval of written notification **																					D			
		Customer written notification **																								D
		Send Final Assessment to Iowa Utilities Board																						D		
Primary and Secondary Research	2.1 Residential Market Baseline study	Residential Survey Design, Sample Mgmt/Logistics																								
		Residential Recruiter Survey, Data Collection, Data Entry, Cleaning Tables,																								
		Residential Analysis/Reporting Presentation														D	M									
	2.2 C&I Market Baseline study	C&I Survey Development, Sample Mgmt/Logistics																								
		C&I Data Collection, Data Entry, Cleaning, Tables																								
		C&I Site Visits Instrument Development, Sample Mgmt/Logistics																								
		C&I Analysis/Reporting/Presentation														D	M									
	2.3 NTG Research	Program material review and survey design																								
		Survey fielding																								
		NTG Analysis																								
		Secondary research for specified programs																								
		Identify future NTG research to be conducted for NTG Oversight Committee																								
		Reporting (Draft, Final)														D	M					D/M				
	2.4 Develop Assessment Model	Adapt model structure to fit client needs and requirements																								
		Testing and quality assurance																								
		Presentation to IUA and IOUs												M												
		Modify model based on IUA and IOUs feedback if required																								
	2.5 Program characterization	Develop list of best practice programs for Achievable potential																								
		Financing Program Impacts Memo and Potential Model Integration													D											
		Program-level inputs (costs, incentive levels, uptake, measures)																								
Potential Assess. and Reporting	3.1 Modeling	Finalise model inputs: Measure Characterization																								
		Model Base-case, assess output vis-à-vis other jurisdictions																	D							
		Technical and Economic Potential Assessment Draft Report, Presentation to IUA and IOUs																	D/M							
		Adjust and deliver model based on client feedback, achievable potential, sensitivity analysis																						D		
	3.2 Reporting and Training	Deliver electronic work papers and spreadsheets and final Potential Assessment Report (hard and electronic copy), pursuant to 199 IAC 35.6(2).																						D		
		Presentation of final Assessment Results																						M		
		Train IUA and IOUs on Excel-based model																							M	

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MichaelsEnergy

5. Major Deliverables

The following table lists the major deliverables to be created from the potential assessment. As deliverables are created, the Dunsky Team will offer in-kind webinars to the interested parties on the Client Team.

Major Deliverables	Description	Target Date:
Detailed Work Plan	Final work plan incorporating comments and feedback from IUA, IOUs and NTG Oversight Committee	Oct 26, 2016
Financing Memo	Memo describing role and best practices for financing programs and the proposed method for capturing impacts in the Potential Assessment	Mar 13, 2017
Draft NTG Report	Draft report on NTG results to IUA, IOUs and NTG Oversight Committee	Mar 21, 2017
Market Baseline Study	Draft Market Baseline Study report to IUA and IOUs including results of primary and secondary data collection and model inputs	Mar 27, 2017
Draft Potential Assessment Results	Draft Technical and Economic Potential draft report to IUA and IOUs	May 5, 2017
Final NTG Results Report	Deliver final NTG report to IOUs, IUA and NTG Oversight Committee	June 20, 2017
Final Report and User-Friendly Model	Deliver electronic work papers and spreadsheets and final Potential Assessment Report to IUA and IOUs (hard and electronic copy) pursuant to 199 IAC 35.6(2)	July 24, 2017

6. Meetings

The following are major meetings that will detail results and present key opportunities for questions and decisions. It will be determined whether it is presented as a webinar or an in-person meeting at a reasonable time period before the meeting date.

Meeting Title	Description	Target Week
Kick off meeting	Official project kick-off meeting between Dunsky Team and IUA members and stakeholders. Focussed on approach, timeline and logistics.	Sep 5th, 2016 (webinar)
Data collection and work plan	Update and approve work plan based on IOU and IUA feedback Discuss primary data collection and NTG scope	Oct 10, 2016 (in-person)
Status Meetings	Monthly updates with IOU/IUA representative(s) via telephone	Second Tuesday of each Month (unless otherwise noted)

Present Draft Model Structure	Present and provide details on the model, including its inputs, sensitivity fields and scenario functions. This is a chance for us to work the IUA to build in the analysis functionality that the IUA wishes to see, and define scenario(s) for the Achievable Potential assessment	Feb 20, 2017
Present Market Baseline Study	Present draft Market Baseline Study report to IUA and IOUs including results of primary and secondary data collection and model inputs	Apr 3rd, 2017
Present Draft NTG results to Oversight Committee	Present draft report on NTG results to IUA, IOUs and NTG Oversight Committee to review and comment Identify the appropriate level of NTG research to be conducted in the future to NTG Oversight Committee and the IOUs and	Apr 3rd, 2017
Present Draft Potential Assessment Results	Present model assumptions/inputs based on primary and secondary research results, draft Technical and Economic potential results and proposed Achievable Potential scenario inputs and assumptions and initial results. Opportunity for IUA and IOUs to review and comment.	May 1st, 2017
Present Final NTG results	Present final report on NTG results to IOUs, IUA and NTG Oversight Committee	July 24, 2017
Present Final Potential Assessment Results	Present Final Technical and Economic potentials and Achievable potential scenario(s) results.	July 24, 2017
Training	Train IOUs and other parties on use of the Excel-based model, dashboard, sensitivity analysis and scenario testing functions	TBD July/August, 2017

7. Key Decision / Data Requests

The following table details the key decision and data requests points that the various key elements require. These are chokepoints which prevent moving forward on a key element.

Decision or Data Request*	Key Element Name	Description of Process	Key Decision Maker / Data Owner	Date of Request (Turnaround time)
Data Request 1*	Baseline survey	Request data and information that the team needs to develop our research plan and sampling strategy for the baseline study primary data collection efforts	Iowa Utilities	2016-09-06 (2 weeks)
NTG Research Approach*	Net to Gross	Dunsky Team confirms the proposed NTG research approach for each program in the utilities EE portfolio.	Iowa Utilities	2016-09-14 (2 weeks)
Data Request 2	Model	Request data to adapt current Excel model to Iowa and initiate measure, program and market characterization	Iowa Utilities	2016-10-11 (2 weeks)

* Event has already passed as of writing this report.

Data Request 2	Net to Gross	Information request consisting of program background materials, prior NTG impact research and program tracking databases.	Iowa Utilities	2016-10-11 (2 weeks)
Feedback on Initial Model Presentation	Model	Receive feedback from IOUs to finalise model structure	Iowa Utilities	2017-02-20 (2 weeks)

8. Chapter 35 Reporting Requirements

The following table details the various events and their dates for the Chapter 35 filings. One major issue to be resolved is the original draft assessments result due date, and the due date required by Chapter 35. This is discussed in section 5 of this report.

Event	Description	Date
Draft Assessment Results for EE Plan Development	Results should be prepared by The Dunsky Team that will help inform the EE plan developer and the utility in order to prepare the in-person meeting for the next month.	April 5th, 2017
Presentation of Draft Assessment Findings and EE Plan to Stakeholders	Typically, an in-person event with a presentation of the initial assessment results and implications for the EE plan. There is also an opportunity for stakeholder input incorporated in the format of the event. Location is normally Des Moines.	May 5th, 2017
Utility approval	Utility approval of written notification of plan and assessment	July 1st, 2017
IUB approval	IUB approval of written notification of plan and assessment	July 15th, 2017
Mail written notifications	Mails written notification to all affected customers of EE plan and assessment	August 31st, 2017
Filing (MidAmerican)	MidAmerican Files its EE Assessment and Plan with the Iowa Utilities Board	November 1st, 2017
Filing (Alliant)	Alliant Files its EE Assessment and Plan with the Iowa Utilities Board	February 1st, 2018
Filing (Black Hills)	Black Hills files its EE Assessment and Plan with the Iowa Utilities Board	April 1st, 2018
Contested Case Proceedings	Within 30 days after filing the plan and assessment it shall be docketed as a contested case proceeding. To be completed within 4 months. During this period, it may be third party reviewed.	30 days after filing date

Appendix 1: Methodology

The following describes in further detail methodological steps of the Iowa Potential Study.

1. Baseline Survey

Overview

To determine the potential of future energy programs, a baseline must be determined for each utility as is possible. While primary research will be the principal input to setting the baseline, the Dunsky Team will consider all the available data sources to complement the primary research as needed. Data sources to be considered include:

- Most recent utility sales data;
- IOU evaluation studies and reports;
- Residential end-use survey results;
- Measure equipment saturation studies;
- Other baseline studies (types and efficiency of equipment in existing and new buildings);
- End-use disaggregation data;
- Secondary research, government and utility surveys of manufacturers and Team experience with Iowa and/or similar regions.

Our team will proceed to identify gaps and, with its substantial on-the-ground experience in Iowa, identify those deemed most critical to ensuring reliable results in a given market segment. This will allow us to direct funds efficiently and effectively to augment data with additional primary research, in the form of surveys and site visits. These data sources will help determine saturation data, equipment type, energy efficiency levels, adoption barrier levels, and the distribution of key equipment and building characteristics (e.g. numbers of units installed per facility for lighting, motors, HVAC, compressed air). The Dunsky Team's baseline will be disaggregated by utility, by sector and sub-sector, and by key end-use.

The primary data collection efforts include a residential baseline survey and commercial and industrial baseline survey, described below. Appendix 3 provides more detailed methodology for the two data collection efforts.

Residential Baseline Survey

We will conduct a mail/Internet survey in conjunction with in-home visits to gather the required residential baseline data. Our experience indicates that administering residential baseline surveys via mail/internet is the most cost effective method of gathering the needed information given the declining share or U.S. households with landline telephones and the potential length and complexity of a survey instrument designed to gather this information via telephone. This method also avoids potential biases associated with residential telephone surveys (e.g. under-representation of younger households).

We will employ a two-pronged approach to collect the required penetration, saturation, and building data for the non-residential baseline study:

1) A mail survey of 1,000 customers and;
2) Site visits to a subset of 100 customers.

Summary: Residential Baseline Survey

Date of Completion	**March 20th, 2017**

Owner	**Jake Millet, Opinion Dynamics**
Dependencies	**Timely return of data requests**

C&I Market Baseline Survey

As with the residential study, we will employ a two-pronged approach to collect the required penetration, saturation, and building data for the non-residential baseline study:

1) A telephone survey of 750 customers and;
2) Site visits to a subset of 150 customers.

The telephone survey sample size will ensure 90%/10% confidence/precision for 10 business customers segments to be defined in collaboration with the IUA and other relevant stakeholders, and assumes a 20% conversion rate for site visits, in line with other similar studies our team has conducted.

We will characterize existing equipment for 10 different business segments working with the IUA to define and combine the segments of highest importance (e.g., grouping the large office segment with the small office segment and the school segment with the college segment). We will design the telephone survey to recruit customers for the on-site visits while also gathering basic facility characteristics and equipment penetration data.

Summary: C&I Market Baseline Survey

Date of Completion	**March 20th, 2017**
Owner	**Mike Frischmann, Michaels**
Dependencies	**Timely return of data requests**

2. Measure Survey (Characterization and Qualification)

The Dunsky Team will review the measures included in the Iowa Technical Reference Manual (TRM) and develop a database of electricity and natural gas energy efficiency measures to be included in the study.

The measure database will include the following items for each measure to be included in the study:

- **Type and Description** (applicable to new construction, natural end-of-life replacement, early retirement, retrofit, operational/maintenance/controls, or whole-building/whole-facility)
- **Unit Savings or Algorithm** (base load or peak gas and electricity savings, as well as water and other quantifiable non-energy benefits***)***
- **Incremental Cost** (including future cost trends, where warranted)
- **Effective Useful Life**
- **Market Barrier Level** (feeds into the adoption model)
- **Applicable Sector, Segment and End Use**
- **Current Market Saturation**

In order to assess these technologies, we will develop assumptions pertaining to evolving codes and standards, compliance levels, and future changes to measure baseline. We will also seek to identify emerging and future technologies that may become commercially viable within the Potential Assessment period, but that may currently be absent from the TRM.

Based on the measure characterization, we will screen the list of measures considered for inclusion within the potential assessment. In particular we will seek to remove measures that are at risk of having achieved or being near full market penetration or maturity, or measures that may not be technically or commercially viable (as opposed to available) or appropriate for Iowa. The retained list should encompass the universe of potentially-relevant, known and *forward-looking* measures and options for Iowa.

Summary: Measure Survey Characterization

Date of Completion	**March 20th, 2017**
Owner	**Martin Poirier, Dunsky**
Dependencies	**Timely submission of current TRM, Data Request 2**

3. Potential Assessment

Phase-in Technical Potential

Technical potential is the theoretical maximum savings opportunity, disregarding constraints such as cost-effectiveness and market barriers. In Iowa's case, this should exclude early replacement and retirement opportunities, which are to be addressed in the subsequent *achievable* potential analysis.

Economic Potential

Economic potential is determined by screening technical potential measures – or bundles of measures – against standard cost-effectiveness tests. It disregards market barriers to adoption.

Our potential model calculates two types of cost-effectiveness ratios. The **Societal Cost Test (SCT) is used to screen measures** for the Economic and Achievable potentials, while **the Participant Cost test (PCT) is an input (among others) for measure adoption rates**. SCT calculations will be customized to meet Chapter 35 Guidelines and IOU current practice, which use an externality factor of 10% and 7.5% (for electrical and natural gas respectively) at the program and portfolio levels, and a threshold of 1.0 for all programs except those targeting low-income customers.

Technical and Economic Potential deliverables include the assessed energy efficiency and demand response potentials by energy source, utility, sector, sub-sector (segment), and end-use, for each year in the forecast (2018-2027), as well as a discussion of results and comparative assessment of the results with previous potential assessment studies in Iowa and similar jurisdictions.

Achievable Potential

Achievable potential can be defined as the amount of energy savings that can be achieved, assuming the aggressive programs are implemented with no budget constraints other than SCT-driven cost-effectiveness requirements. Our user-friendly model will produce an upper-bound "maximum" savings scenario, taking into consideration realistic market penetration rates over the study period, using the methodology described below.

Program Archetypes: A set of best-in-class program archetypes will be developed based on our Team's experience, best practices, discussion with the IUA, and knowledge of existing DSM programs in Iowa (as well as similar regions). Program archetypes will be designed to capture all special programs defined in Chapter 35, including low-income programs, cost-effective assistance to homebuilders and homebuyers, and tree planting. In addition, optional financing programs will be built into the analysis and included in the sensitivity options (see

inset box). Financing efforts will be designed to cover such options as residential and commercial PACE, public building financing, and on-bill financing (OBF) or -recovery (OBR).

Refined Adoption Rates: Over time, Dunsky has developed a sophisticated adoption model that we believe best captures likely market uptake of potential measures. Rooted in the U.S. DOE's adoption curves, our model bases adoption on a combination of customer cost-effectiveness – applied differently for each sector – and levels of market barriers.

Competition Groups, Chained Measures and other Factors: The Dunsky model introduces competition groups at the achievable potential level. Multiple measures that compete with each other for the same market can be selected if they are all cost-effective. In that case, each measure is attributed a share of the overall market based on its base adoption rate compared to other measures.
Our model also dynamically accounts for cumulative effects of "chained measures". For example, if insulation is added in a given building, savings from an efficient furnace installed afterwards in the same building will be reduced (as less heat is needed to meet the building's heating requirements). Based on user input, the model automatically calculates these cumulative effects according to measure screening and uptake under a given scenario. Interactions between electricity and gas programs are also considered, in order to assess how program delivery may impact not only adoption rates, but also other potential effects such as program administration costs per participant.

Scenario Analysis

Base Scenario (report): As specified in the RFP, we will provide the IUA with a detailed analysis of an "upper-bound" scenario, i.e. maximum achievable savings from aggressive implementation of best-in-class programs.

Alternative Scenarios (report): Our model is built from the ground up to provide full flexibility in assessing multiple scenarios and sensitivities. To take advantage of this, we propose meeting with the UIA to determine together 2-3 alternative scenarios that we will produce and include in the final report.

Alternative Scenarios (ongoing use): Our model recognizes that things change over time – avoided costs, measure costs, incentives, cost of capital, etc. – and is built to dynamically adjust to new parameters. We will provide the IOUs with a licensed copy of the model – as well as associated training – that will allow you to change key parameters, to test key assumptions, and to run boundless scenario and sensitivity analyses, all without the need for additional support.

Summary: Draft Potential Assessment Results

Date of Completion	**May 29th, 2017**
Owner	**Martin Poirier, Dunsky**
Dependencies	**Completion of Baseline, NTG, and Financing Report Drafts**

4. Final Model and Results + Training

The Dunsky Team will apply our proprietary, user-friendly, transparent and fully adjustable potential model to estimate Iowa's electricity and natural gas energy saving potentials. We will adapt our model by incorporating Iowa's characteristics with respect to measure inputs, equipment saturation, and measure adoption assumptions, as well as all economic and related parameters. To meet the IUA's needs, our model will apply a state-wide potential model structure that can produce outputs at the specific levels of disaggregation required

by the IUA, including separation of the gas and electricity potentials as well as disaggregation by IOU, sector, program type, end-use and measure.

At the end of the project, we will deliver a fully-operational, Iowa-specific working version of the Excel-based model, along with a license for its use. The model will include the study's assumptions and full Technical, Economic and Achievable potential scenario results, and will be calibrated and ready for IUA and IOU staff to perform further sensitivity analysis. There will also be an in-person training conducted on the model's use.

Summary: Final Model Results

Date of Completion	**July 24th, 2017**
Owner	**Martin Poirier, Dunsky**
Dependencies	**Completion and Revision of the Draft Assessment results**

Summary: Model Training

Date of Completion	**July/August, 2017**
Owner	**Martin Poirier, Dunsky**
Dependencies	**Completion of the final model**

5. NTG Research

The net-to-gross (NTG) assessment of key programs in the utilities' portfolios of efficiency programs will play an important role to inform the estimation of potential. As outlined in the *Iowa Energy-Efficiency Net-to-Gross Report,* evaluators use a variety of approaches to quantify program influence and establish the counter-factual; that is, to determine what would have happened in the absence of program efforts.

For three key programs, we will conduct primary research to develop program and utility-specific NTG ratios. It should be noted that the primary research conducted for the NTG assessment is based on surveys with *program participants*. In contrast, the baseline study collects data from the general population. As such, our NTG approach includes primary data collection that is specific to the NTG analysis and does not leverage the baseline surveys.

Below we outline our data collection and analytic approach for the NTG assessment.

Proposed NTG Methods

We carefully reviewed the *Iowa Energy-Efficiency Net-to-Gross Report* published in September 2015 and the comprehensive set of potential NTG methods for each program type outlined therein. Based on our review, and with the approval already received from the Iowa utilities and the IUA, we will employ the NTG research approaches outlined below. This research will (1) provide inputs for the potential study and (2) support Iowa in the transition from a framework that uses a deemed NTG ratio of 1.0 for all programs and measures, to an approach that blends a variety of perspectives and strives to determine the best NTG methodology for each program.

1. **Primary data collection:** We will conduct primary research for three key programs offered by all three IOUs: Non-residential Prescriptive, Non-residential Custom, and Residential Prescriptive. Based on the Iowa NTG report, we understand that these programs account for a large share of the IOUs' expected portfolio expenditures and savings. Our NTG analysis for these three high impact programs will employ a

participant survey (self-report approach) to gather the data necessary to estimate free-ridership and participant spillover. We will design two separate survey instruments, one for the residential programs and a combined instrument for the non-residential prescriptive and custom programs. We will target to complete a total of 360 interviews with residential customers and 480 interviews with non-residential customers. These sample sizes will allow us to meet or exceed the industry standard 10% precision at 90% confidence, by IOU and program. The output of this research will be nine program/utility specific NTG ratios.

2. **Secondary research:** For programs that account for a smaller share of program expenditures and expected savings, we will leverage secondary data to develop program-specific NTG ratios. Specifically, we will review NTG analyses of similar programs, offered in similar jurisdictions, that use the NTG methods recommended in the 2015 Net-to-Gross Report. This review will result in a "deemed" NTG value for each type of program informed by recent research. Programs in this category include four residential programs (Residential Assessments, Change-a-Light / Upstream Lighting, Appliance Recycling, and Residential New Construction) and three non-residential programs (Non-Residential New Construction, RCx / Industrial Partners, SBDI / Commercial Energy Solutions. The output of this research will be seven program-specific NTG ratios. If relevant, we might provide additional detail by end-use or measure category.
3. **Existing NTG values:** The 2015 Net-to-Gross Report identifies several programs for which net savings are currently available (Residential and Non-Residential Load Management, and Residential Behavior). For these programs, we will use the existing values.
4. **Deemed values:** The Net-to-Gross Report identifies several programs for which the expected net benefit of investment in NTG research is not positive. These are programs with a very small contribution to overall savings and/or programs focused on low income customers. For these programs, we will use a deemed value of 1.0.

Ideally, we would conduct primary research for all programs where such research is beneficial. However, primary NTG research can be an expensive endeavor. We believe that our approach strikes a good balance between the higher certainty and rigor of primary research and the realities of limited budgets. Our approach will produce the highest rigor results for programs with the highest impact on overall portfolio outcomes and the greatest impact on our potential study results.

The following table summarizes the NTG approach for each of the programs in the Iowa utilities' portfolios.

	Approved Approach			
Program	**Primary Research**	**Secondary Research**	**Existing Value**	**Deemed 1.0**
Alliant Energy				
Residential Prescriptive	✓			
Custom Rebates (all)	✓			
Non-residential Prescriptive	✓			
Home Energy Assessment		✓		
Change-a-Light		✓		
Appliance Recycling (all)		✓		
Commercial New Construction Program		✓		
New Home Construction		✓		
Non-residential Interruptible Program			✓	
Residential Direct Load Control Program			✓	

	Approved Approach			
Program	**Primary Research**	**Secondary Research**	**Existing Value**	**Deemed 1.0**
Low Income Weatherization				✓
Business Assessments Program				✓
Agriculture				✓
Low Income Multifamily and Institutional				✓
Multifamily				✓
Low Income Energy Wise Education/Energy Savers				✓
Black Hills Energy				
Residential Prescriptive Program	✓			
Non-residential Prescriptive Program	✓			
Non-residential Custom Program	✓			
Residential Evaluation Program		✓		
Residential New Construction Program		✓		
Non-residential New Construction Program		✓		
Low Income Weatherization /Weatherization Team				✓
Low Income Affordable Housing				✓
Low Income Energy Education				✓
Low Income Multifamily Efficiency Improvements				✓
GIAC				✓
Non-residential Evaluation Program				✓
MidAmerican Energy				
Residential Equipment Program	✓			
Non-residential Equipment Program	✓			
Commercial Energy Solutions		✓		
Commercial New Construction Program		✓		
Industrial Partners Program		✓		
Residential New Construction		✓		
Residential Assessment Program		✓		
Upstream Lighting		✓		
Appliance Recycling Program		✓		
Non-residential Load Management			✓	
Residential Load Management			✓	
Residential Behavior Program			✓	
Multifamily Program				✓
Residential Low Income Program				✓
Residential HVAC Tune-up				✓
Agriculture Program				✓
Non-residential Low Income				✓

In support of the primary research, we will develop several interim deliverables: (1) participant survey instruments, (2) free-ridership and participant spillover algorithms, and (3) sampling plans. We will share these with the Iowa utilities and the IUA for review and approval.

Summary: DRAFT NTG Report

Date of Completion	**March 20th, 2017**
Owner:	**Antje Flanders, Opinion Dynamics**
Dependencies:	**Timely return of all data requests**

Summary: FINAL NTG Report

Date of Completion	**July 24th, 2017**
Owner:	**Antje Flanders, Opinion Dynamics**
Dependencies:	**Draft NTG report**

6. Financing Memo

The IUA has highlighted the potential impact of financing on the adoption of energy efficiency measures for specific treatment in the potential study. In order to inform the treatment of financing programs within the potential model, we will prepare a memo highlighting how financing may impact measure adoption considering its interactions with incentive programs, its ability to lower uptake barriers, and its specific role or impact in each modeled sector, and varied impact on specific measure classes. The memo will examine these impacts for a range of efficiency financing options and program models, including On-bill repayment (OBR), Property Assessed Clean Energy (PACE), secured and unsecure bank and credit union loans, equipment leases, and other relevant other tools.

The memo will outline the methodology for including financing program effects in the model, and will provide the IUA and its members with the opportunity to review and give feedback on our approach. Ultimately, this will allow the model to test scenarios with and without financing impacts, and for various levels of financing program support.

Summary: Financing Memo

Date of Completion	**March 13th, 2017**
Owner	**The Dunsky Team, (Alex Hill, DUNSKY)**
Dependencies	**Timely return of all data requests**

7. Regulatory Support

As an additional service, The Dunsky Team can provide various regulatory support services for the Client Team. Specifically, this may occur during the contested cases stage with a third-party intervener. In this case, the assessment and plan may be reviewed and proposed modifications or rejections can be filed. There would also be an exchange of testimony, data and potential meetings/adjustments. The Dunsky Team can provide regulatory support services and plan of action if the need arises.

Summary: Regulatory Support for Contested Cases (if needed)

Date of Completion	**30 days after utility filing**
Owner	**Alex Hill, Dunsky**
Dependencies	**If case becomes contested**

Appendix 2: Chapter 35 Reporting Requirements

Summary of Potential Study Requirements in Chapter 35:

This section outlines the most important points of Chapter 35 as it relates to the Potential Study. Each section is referenced from the original study in brackets. Various comments are included in italics for the Dunsky Team's use.

1. Potential Study must include economically achievable programs designed to attain performance standards set by the board [35.3]
2. Specify which energy efficiency programs are attributable to the electric option, gas option or both [35.3]
3. The utility's assessment of potential and energy efficiency plan shall include a summary not to exceed 5 pages in length, written in a non-technical style, for the benefit of the general public [35.8]
4. The utility's assessment shall address the potential energy and capacity savings in each of ten years subsequent to the year the assessment is filed. [35.8(1)]
5. Economic and impact analysis of measures shall address benefits and costs over the entire estimated lives of energy efficiency measures. At a minimum the assessment of potential must include data and analysis as follows: [35.8(1)]
    a. Baseline survey projecting annual peak demand and energy use of customers' existing and estimated new energy-using buildings and equipment
    b. Survey to identify and describe all commercially available energy efficiency measures and their attributes needed to perform the assessment of energy and capacity savings including but not limited to
        i. All relevant costs of the measures
        ii. Utility bill savings
        iii. Utility avoided cost savings
        iv. Peak demand and energy savings
        v. Measures' lifetimes
        vi. Current market saturation of the measures
        vii. Market availability of the measures
        viii. Non-energy-related features
        ix. Costs and benefits
    c. Description of the methods

Schedule date reminders

6. Schedule of Filings 35.4 –

a. Written notice of assessment of potential and energy efficiency plan **no more than 62 days prior to filing** the assessment of potential and energy efficiency plan. The notice shall be submitted to the board for approval **no less than 30 days prior to the proposed notification of customers**.

Dunsky Team comment – There are details on what the notice shall include. I would assume the vendor creating the plan will be collaborating with the utilities on the notifications more than we will, it is important we are aware of the schedule since the utilities will undergo energy efficiency plan development while we are conducting the potential study.

7. The utilities must provide the opportunity to offer suggestions for programs and for the assessment of potential and to review and comment on a draft of the assessment of potential to be submitted by the utility [35.6(1)]

   a. The opportunity to participate must commence **at least 180 days prior to the date the utility submits it assessment of potential** and plan to the board.

8. Contested case proceeding – **within 30 days after filing** each application for approval of the assessment of potential shall be docketed as a contested case proceeding. [35.6(2 &3)]

   a. All testimony, exhibits and work papers shall be filed with each application for approval of an assessment of potential and energy efficiency plan.

   b. The OCA or 3rd party intervener may propose approval, modification or rejection of a utility's assessment of potential. They will have to provide:

      i. An analysis and statement showing why the rejection or modification is appropriate

      ii. An estimated implementation schedule for any modification or alternate plan and why approval is appropriate

      iii. A statement of projected costs and benefits and benefit/cost test results of any modification or alternate plan and the amount of difference from the utility's projected costs and benefits.

9. Assessment of Potential and determination of performance standards Items below are bulleted references.

Dunsky Team comment - everyone is encouraged to read this section (Chapter 35; Section 35.8, starting on page 6)

At a minimum each utility's assessment of potential shall include data and analysis as follows:

   a. Baseline survey projecting annual peak demand and energy use of customers' existing and estimated new energy-using buildings and equipment.

   b. A survey to identify and describe all commercially available measures and their attributes

   c. A description of the methods and results for any screening or selection process used to identify technically viable energy efficiency measures.

d. An assessment of the annual potential for utility implementation of the following special programs:

   i. Peak demand and energy savings for programs targeted at low income customers (including cooperative programs with community action agencies)

   ii. Implementation of trees programs

   iii. Peak demand and energy savings from cost effective assistance to homebuilders and homebuyers in meeting the requirements of the Iowa model energy code.

   Dunsky Team comment – currently IECC 2012, adopting IECC 2015

e. An identification of the utility's proposed performance goals for peak demand and energy savings from utility implementation of cost effective energy efficiency programs and special programs.

Dunsky Team Comment - The utility will use this data to create goals in the energy efficiency program by year, program and total plan for 5 years subsequent to the filing. The utility will be required to fully describe its data and assumptions for the following, therefore our data should be presented in a way to assist)

   i. Cost-effectiveness tests

   ii. Cost-effectiveness thresholds

   iii. Description of the proposed programs (including implementation number of eligible participants, proposed rates of participation per year, and peak and energy savings)

   iv. Budgets or level of spending for utility implementation of programs *(Note: budget categories are 1) Planning and design, 2) Administrative, 3) Advertising and promotional, 4) Customer incentive, 5) Equipment costs, 6) Installation costs, 7) Monitoring and evaluation, 8) Miscellaneous)*

   v. Rate impacts and average bill impacts, by customer class, resulting from implementation of programs

f. An optional sensitivity analysis *(needed if the proposed energy and capacity savings differ from the current plan by more than 25 percent)*

10. Electric utilities must provide a detailed load forecast and Gas utilities must provide a forecast of demand and transportation volumes.

Dunsky Team comment: This is in the plan preparation and I do not believe it is part of the assessment of potential. If I am wrong and we inform this information with our data we will need to become familiar with section 35.9, pages 9 – 13.

Chapter 35 Requirements Timeline

The filing dates for the EE plan and Assessment for each utility is as follows:

MidAmerican: November 1st, 2017
Alliant: February 1st, 2017
Black Hills: April 1st, 2017

Below is a series of tables in chronological order is presented to display the Chapter 35 requirements starting from the anchor date of Nov 1st, 2017, the first filing deadline for MidAmerican. The other two utilities will have more flexibility in these dates as they do not have to file until a later date.

1. Draft Assessment Results for EE Plan Development

Date	**April 5th, 2017**
Owner(s)	**The Client Team**
Recipient	**Stakeholders + Plan Development Vendors + Utilities**
Notes	**Results should be prepared by The Dunsky Team that will help inform the EE plan developer and the utility in order to prepare the in-person meeting for the next month.**

2. Presentation of Draft Assessment Findings and EE Plan to Stakeholders

Date	**May 5th, 2017 (latest date, 180 days before filing)**
Owner(s)	**The Client Team**
Recipient	**Stakeholders + Plan Development Vendors + Utilities**
Notes	**This is typically an in-person event with a presentation of the initial assessment results and implications for the EE plan. There is also an opportunity for stakeholder input incorporated in the format of the event. Location is normally Des Moines.**

3. Utility Approval of Written Notification of Plan and Assessment

Date	**July 1st, 2017**
Owner(s)	**Plan Vendor (Dunsky will help inform notification with assessment results)**
Recipient	**Utilities**
Turnaround Time	**15 days (to allow for utility review and approval cycles)**

4. IU Board Approval of Written Notification of Plan and Assessment

Date	**July 15th, 2017**
Owner(s)	**Plan Vendor**
Recipient	**IUB**
Turnaround Time	**45 days (30 days required)**

5. Mail written notifications to all affected customers of plan and assessment

Date	**August 31st, 2017**
Owner(s)	**Plan Vendor (Dunsky will help inform notification with assessment results)**
Recipient	**Affected Customers (TBD)**
Turnaround Time	**62 days (required)**

Appendix 3: Baseline Research Study Approach

Note: The following is an outline of the Baseline Research Study Approach. After the first in-person meeting, various decisions will be made that will enable to drafting of the complete document. Once completed, the details will be added to this work plan.

Residential Baseline Survey

1. Sampling Plan
    a. Sample frame
        i. Segments under study – single family, multi-family, low income
    b. Sampling strategy
2. Measures Included
3. Data collection plan
    a. What is collected via mail survey vs. site visits

Commercial and Industrial Baseline Survey

1. Sampling Plan
    a. Sample frame
        i. Usage characteristics
        ii. Segments under study
    b. Sampling strategy
2. Measures Included
3. Data collection plan
    a. What is collected via phone survey vs. site visits