Proposal

Rhode Island Energy Efficiency Market Potential Study Refresh

RFP No. EERMC-2022-03

August 5, 2022, 5:00 PM

Prepared for:

STATE OF RHODE ISLAND
ENERGY EFFICIENCY & RESOURCE MANAGEMENT COUNCIL

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About Dunsky

Founded in 2004, Dunsky supports leading governments, utilities, corporations and non-profits across North America in their efforts to **accelerate the clean energy transition**, effectively and responsibly.

Working across buildings, industry, energy and mobility, we support our clients through three key services: we **quantify** opportunities (technical, economic, market); **design** go-to-market strategies (plans, programs, policies); and **evaluate** performance (with a view to continuous improvement).

Dunsky is proudly Canadian, with offices and staff in Montreal, Toronto, Vancouver, Ottawa and Halifax.

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Offeror's Name:	Dunsky Energy + Climate Advisors

RFP Information	
Title of RFP:	Rhode Island Energy Efficiency Market Potential Study Refresh
RFP Number:	EERMC-2022-03

Offeror Information	
Legal Name of Offeror:	6893449 Canada Inc.
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_____ August 4th, 2022
Signature of Authorized Person Date

Alex Hill, Partner
_____
Printed Name, Title

Overview

Dunsky Energy + Climate Advisors is pleased to submit this proposal in response to the Request for Proposals (RFP) for the Rhode Island Energy Efficiency Market Potential Study (MPS) Refresh RFP No. EERMC-2022-03. As the Evaluator that performed the original MPS, we are uniquely positioned to support the Council in this study refresh for three key reasons:

1. **Deep Rhode Island expertise.** Dunsky conducted the 2021-2026 MPS and has conducted nine other potential studies in the Northeast in recent years, through which we have developed a detailed understanding of the efficiency and demand response context in Rhode Island. We will build on this background to identify and apply appropriate data sources in this study using our expertise to assess how the energy context has evolved since the prior MPS was conducted.

2. **Focused analysis on issues important to Rhode Island.** We offer to account for important recent developments, such as the passage of the Act on Climate legislation in 2021, which highlights Rhode Island's commitment to greenhouse emission reductions. We will include in the reporting an analysis of the GHG reduction potential from efficiency measures, how efficiency programs can contribute to mandatory GHG reduction targets and highlight insights and recommendations for maximizing the GHG reduction potential of efficiency measures. Moreover, recognizing the impact of gas system constraints in Rhode Island, we offer an option to include an assessment of passive natural gas demand savings from efficiency measures in this study update.

3. **Cost-efficient and timely study delivery.** Dunsky has retained the models and input data from the 2021-2026 MPS which can be updated and adapted for this update study at a relatively low cost, and with a quick turn-around time. We have proposed an approach to identify key data sources to update the model inputs (key savings measures, add new measures, update market and avoided cost data, and incorporate / calibrate to recent program performance) that will allow our team to deliver an updated study that is consistent and comparable to the prior MPS, but captures the elements that have changed the efficiency and demand response potentials in the past three years. By leveraging our existing tools and reporting templates, we will be able to conduct this update for a fraction of the original study cost and make clear to the EERMC and relevant stakeholders the rationale behind the new results *vis-à-vis* the prior study results.

In addition to the core scope, Dunsky offers two value-adds that may be of interest to the EERMC in relation to the MPS update:

A. Detailed heat pump potential modeling using Dunsky's sophisticated HEAT™ model. This offers more nuanced adoption modeling of heat pump incentives for electric resistance heating customers growing rapidly (highlighted in 2022 annual report).
B. Electric Vehicle Adoption projections using Dunsky's industry leading EVA model and associated EV expertise.

Together these options would help to improve program and energy consumption potential assessments, adding further insights into DR potentials, and GHG impacts across Rhode Island.

In the following sections, we outline our approach to conducting the MPS update and deliver the results and reporting according to the EERMC's needs.

Work Plan and Approach

Our approach is designed to create ***lasting benefits*** for Rhode Island, many of which are likely unique to our proposal. These benefits stem from the emphasis we put on the Energy Efficiency and Resources Management Council's ("EERMC's" or "the Council's") perspective, which means focusing on:

The highest quality and most defensible results through effective interpretation of primary data, supplemented with our team's knowledge and experience in Rhode Island ("RI") and other relevant jurisdictions.

A rigorous and fulsome analysis of savings opportunities across all sectors and segments, covering all end-uses, emerging technologies, and demand response opportunities.

Transparency and post-study usability using our Excel-based potential model which enables boundless scenario analyses and is entirely free of black box calculations and features.

Our team's proven track record, derived from our team's experience delivering accurate and reliable potential study results, based on our rigorous methods and systematic quality assurance protocols.

Compelling communications and client-focused project management that support the EERMC's planning and vision, and continuously adjusts to changing timelines and needs.

We have carefully reviewed the RFP and requirements and our proposal covers all the required data treatment, computational analysis and reporting.

Analysis Tasks

Task 1: Identify Data Sources and Collect Input Data

The Dunsky team has a strong understanding of the Rhode Island efficiency context, the data available, and how it can be harnessed to prepare an accurate assessment of energy efficiency potential in the state. In addition to RI-specific sources, our team has recently conducted three potential studies in MA – and nine in total in nearby jurisdictions – giving us a wealth of recent secondary data that can be used to verify and validate the updated inputs and assumptions in the to the MPS update.

We will effectively access and apply all data sources outlined in the RFP to update the inputs to the MPS based on the prior study (2021-2026 MPS). When it comes to updating model inputs, we will consistently apply the hierarchy outlined below, citing sources and indicating when any non-RI specific data is used to adjust inputs.

1. RI C&I and Residential baseline results: We will apply, above all other sources, the electric and natural gas distribution utility's most recent RI baseline studies to update equipment saturations for all measures.
2. Other RI specific sources: Next, we will use the RI TRM for measure savings inputs, and apply other evaluation and market studies to supplement the equipment

saturations. Additional supporting information will be pulled from relevant reports and dockets, such as recent electricity and gas rate case (Docket 4770) and the Governor's Power Sector Transformation Initiative and the related Settlement Agreement.

3. MA baseline data: Where there may still be any holes in the measure saturation data, we will turn to recently completed market studies in Massachusetts (MA). Dunsky has recently treated them for three potential studies and can easily use these to fill gaps in the RI baseline studies, and benchmark key inputs to ensure statistically realistic ranges are maintained.
4. Other data from the Northeast U.S.: Finally, we will look to our team's pool of recent program designs, evaluations and potential studies in the region (and other available reports and studies) to benchmark the study findings and establish valid inputs and ranges for efficiency programs and economic inputs.

Building on these data sources applied in the initial potential assessment, we will update inputs with relevant more recent sources, which may include:

- Any more recent RI-specific baseline study data as available
- Updated measures in TRM (we will update measures accounting for at least 80% of the savings, using updated RI TRM PY 2020 or more recent versions as may be available.)
- Recent evaluated program results to update program characterization for cost estimates
- AESC 2021 data for avoided cost inputs
- Updated MA baseline data to fill any gaps in the RI specific data.

Our data treatment will follow the steps outlined below:

Step 1: Kick-off Meeting and Workplan

Prior to the in-person kick-off meeting, we will review all available studies on the EERMC website and ensure that we are familiar with the available RI data sources. We will come to the meeting with an initial overview of which study inputs would be updated, and which more recent sources we would propose to apply. During the meeting, we will work with the MPS Management Team ("MPS MT") to identify and prioritize information gathering activities and sources.

We will also provide an overview of our detailed workplan for discussion in the meeting, and gather feedback on the schedule milestones, scope, inputs and reporting structure. A detailed workplan will be provided soon after the kick of meeting, incorporating MPS MT feedback and the results of our initial review of available data. It will detail the analytical/methodological approach and project delivery approach as well as data sources and gaps.

Step 2: Prepare Data Requests

Soon after the workplan is submitted we will produce a detailed data request for the distribution utility, OER and the EERMC, outlining the relevant data needed from each source. The data requests will provide specifics on the key data fields, requested file formats, data confidentiality considerations (anonymizing or secure transfer sites) and a target delivery date to maintain the study schedule.

We have experience working with confidential utility data and will respect all required data protection protocols. We also offer to establish a secure Microsoft SharePoint server to facilitate data transfers specific to each source if any do not wish to establish their own data transfer sites. If the utilities prefer to sort and anonymize their customer data, we will provide guidance on the specific C&I and residential market segments, including listing of NAICS/SIC codes to group and consumption bucket thresholds.

Step 3: Compile and Supplement RI Baseline Study Data

The central source for the equipment/measure saturations will be the RI market baseline studies. We will begin with the saturation data as developed for the original MPS study, and we will adjust and adapt to more recent baseline studies as available, and other information such as program data or other relevant evaluation studies. We will update the baseline equipment saturations needed as model inputs following the data hierarchy outlined above, starting with the RI market baseline study findings.

Task 2: Estimate the net effect of exogenous factors affecting program and measure baselines over the source of the MPS study period, 2024-2026

Our model and potential study approach applies a range of factors to capture the impact of exogenous factors. First, we prepare a baseline sales assessment, capturing projected sales for each year of the study period for each fuel. This accounts for key considerations such as prior efficiency program impacts, baseline adjustments, natural uptake of efficiency measures, and pre-study period codes and standards impacts. We then account for a full range of exogenous factors in our model:

- **Building codes:** We will review the new building code assumptions employed in previous study (i.e., 2018 IECC baseline in 2024 and 2021 IECC baseline in 2025-26) for reasonableness based on the most recent available information .
- **Appliance and equipment standards: The** Appliance Standards Awareness Project database and Department of Energy rulemaking documents are used to identify new standards to be considered for the study. We apply all applicable upcoming standards coming into effect during the study period.
- **Enabling infrastructure:** We will consider Advanced Metering Functionality (“AMF”) as an enabler of Behind the Meter (“BTM”) DR programs, and Time of Use (“TOU”) rates.
- **TOU rates:** We assess the electric peak load reduction potential of time varied rates depending on the peak to off peak ratio and apply an efficiency retention factor to capture overall savings impacts.
- **Enabling strategies:** Direct install, contractor training, home and building energy labelling, and mid/upstream programs can help reduce customer barriers in the market.

These are captured in our potential model program inputs, to provide an assessment of the marginal impact on achievable potentials and portfolio costs.

We will apply the factors as per the methodology applied in the 2021-2026 MPS, updating any data or inputs as available and appropriate.

Task 3: Update measure list and gather all data needed to estimate potential

Under this task, Dunsky will develop a draft measure list to MPSMT for review, comment, and approval that is an update of the previous energy efficiency and demand response measure list included in the prior MPS. We will leverage the prior study's database of input data and make updates as warranted.

Step 1: Prepare Measure Lists and Incorporate MPSMT feedback

Energy Efficiency Measure List

For the previous study, the Dunsky Team assembled a comprehensive energy efficiency measure list based on all measure types included in the original study RFP, and considering past National Grid programs and the RI TRM as well as TRMs from other relevant jurisdictions that may contain further measures. We will review this list against our current database of energy efficiency measures as well as recent program data (i.e. benefit-cost model) from the distribution utility, the updated RI TRM, and other relevant sources to identify any new measures that should be added to the study refresh.

We will update measure characterizations for the most impactful measures (i.e. the measures that collectively represent up to 80% of the savings assessed in the prior study with comparison to recent program data to ensure any significant measures are included, depending on available data and TRM updates) and offer to add up to 5 new residential and 5 new commercial measures.

We will then prepare a database of electricity, natural gas and delivered fuels energy efficiency measures that includes all key inputs (e.g., unit savings algorithms, EULs, incremental costs, and baseline changes associated with evolving codes and standards). We will document all sources in the database and provide it to the Council to review in MS Excel format.

Demand Response Measure List

For the previous study, the Dunsky Team assembled a comprehensive demand response measure list based on our internal database of over 60 DR measures developed from past potential studies. We will review this list against our current database of demand response measures as well as recent program data (i.e. benefit-cost model) from the distribution utility, the updated RI TRM, and other relevant sources to identify any measures to update or new measures that should be added to the study refresh (up to five new measures).

For each measure we will characterize the cost, control equipment, typical incentive structure, DR program constraints (i.e. maximum event calls per year, event duration constraints, etc.) and possible links to ancillary benefits. We prepare an hourly load curve for each measure accounting for the baseline and DR adjusted hourly demand to be applied in the model.

Step 2: Characterize Measures and Markets

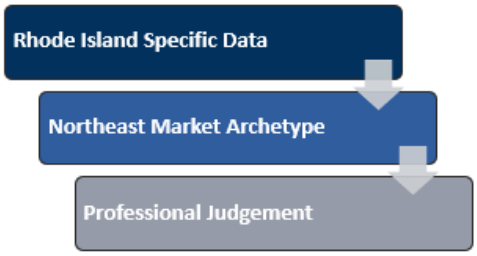
When it comes to developing model inputs, we will consistently apply the hierarchy outlined below, citing sources and indicating where non-RI specific data is used to adjust inputs.

Measure characterization: We will begin with the measure characterizations applied in the 2021-202 MPS, and update measure characterizations as appropriate. The previous study used a updated draft of the TRM as provided on 9/23/2019 as the primary basis for measure characterization. We will request the most recent version of the eTRM and compare it to the eTRM used for the prior MPS to identify where changes have been made to incorporate into the study refresh. Where there is no supporting entries in the RI TRM or other RI-specific documents, we will look to the original measure source TRM and associated updates. For unique measures, we will develop custom characterizations, which will be documented in the report appendix.

Market characterization: We will begin with the market characterizations applied in the 2021-2026 MPS and make adjustments as appropriate based on available updated data sources. We will apply Rhode Island specific data to the fullest extent possible beginning with any updated Rhode Island C&I and Residential baseline study results since the prior MPS. We will also make adjustments based on recent RI program data. Where there may still be any holes in the measure saturation data, we will turn to recently completed market studies in the Northeast. Where data from RI or nearby jurisdictions do not exist, Dunsky will use our deep bench of expertise and employ professional judgement to propose any reasonable adjustments to the market inputs.

Savings characterization inputs hierarchy:

Market (Pen/Sat) characterization hierarchy:



Task 4: Estimate economic and maximum achievable energy efficiency and demand response savings in Rhode Island

Energy Efficiency Potential

We will apply our proprietary potential model to estimate Rhode Island's energy efficiency (all fuels) saving potentials at the Technical, Economic and Achievable levels using Dunsky's DEEP model. The model will be loaded with the measure and market characterization inputs as described in the earlier tasks, as well as RI specific economic data, including avoided costs of all fuels projected out to 2050, discount rates, and baseline sales projections.

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. Key inputs for the economic potential modelling will be requested from the utilities, including: avoided costs, discount rates, marginal consumer rates (to assess adoption), and any other component that is included in the RI test.

The achievable potential can be defined as the amount of energy and demand savings that can be achieved, assuming reasonably aggressive programs are implemented and meeting RI Test-driven cost-effectiveness requirements. We will assess four or more achievable potential scenarios (including Maximum and Program scenarios), taking into consideration realistic market penetration rates over the study period, using the methodology described below.

MAXIMUM ACHIEVABLE SCENARIO / SENSITIVITY ANALYSIS

We will include the economic and maximum achievable potential scenarios in the study findings reports, as outlined in the RFP, and considering all relevant input factors and constraints.

However, in addition to these scenarios, we will also provide estimates of technical potential and achievable potential under current program conditions (i.e., business-as-usual) – at the request of the MPSMT – as these outputs will need to be generated in order to calibrate the model to recent program performance. These will be provided in the detailed data tables, but not included in the study update reporting.

In addition, our potential model allows a full range of sensitivity analysis to any key input factor, including avoided costs, fuel costs, discount rates, measure incremental costs, and budget constraints. We will provide a set of tornado graphs (and underlying data in table format) demonstrating the impact of these factors on the potential and portfolio budgets.

OPTIONAL SCOPE ITEM: As an optional scope item, we offer to apply the peak demand to annual usage ratio outputs developed as part of the of the National Grid Rhode Island Gas Load Shapes study (published January 25, 2021) to the updated MPS results to estimate passive natural gas demand savings from efficiency measures at a cost of $10,000. The ability to deliver this scope item assumes access to the electronic version of the Load Shape Library developed as part of the study. Passive gas demand savings would be included in the reporting and detailed results files

Demand Response Potential

Dunsky's approach to analyzing the active electric Demand Response (DR) potential[1] in RI accounts for a number of important factors that are critical to obtaining an accurate read on how DR can lead to real, achievable utility peak load reductions:

[1] All demand response measures in this document refer to active demand response. Passive demand reductions resulting from newly installed energy efficient equipment or behavioral measures is captured in the DEEP model. This will be applied to reshape the utility load curve prior to conducting the final active DR potential assessment.

- DR potential is time-sensitive, peaks occur for a number of very specific periods.
- DR measures can have rebound effects
- DR potential must consider interactions with the distribution utility's 8,760 load profile.

Our approach recognizes that DR measure impacts must be tested against the utility load curve to accurately assess the potential peak impacts as well as the cost effectiveness of the proposed measures. To accomplish, we will apply the follow steps.

Step 1: Utility Load Curve Analysis

We will review the standard peak day and DR parameters developed for the prior study and assess if these require updating based on recent load curve data. Load curves and annual peak demand projections will be adjusted to apply efficiency, measure demand savings and curve shaping impacts as part of an update between draft and final results.

Step 2: Define and Apply Measures:

Using the list of DR measures, we will apply the RI-specific baseline and DR measure load curves, costs, and benefits that are appropriate to address the RI utility system peaks as developed for the prior study. We will make adjustments to key measures where appropriate based on the review of the utility load curve data.

Step 3: Assess Economic and Maximum Achievable Potential

We will then assess the optimized maximum potential applying empirical propensity curves (developed by the Lawrence Berkeley National Laboratory for each market sector), cost-effectiveness screening, and dynamic utility load shape adjustments to determine the impact of each measure in each scenario combination. Between the Draft and Final Results, the DR analysis will be updated to account for EE impacts on the utility load curve.

Our DR model optimizes the potential based on program constraints and equipment hourly load curves. We typically apply the most constrained programs first (i.e. curve shaping programs such as TOU rates), followed by the more flexible options like critical peak rebate programs to arrive at a layered read of the achievable potential, and the resulting utility load considering all interactive effects and peak shifting impacts.

- **Economic Potential:** Assess the demand reduction potential of all DR measures that pass cost- effectiveness screening based on the marginal avoided costs and the utility costs. This is presented on a measure-by-measure basis, and is not considered additive among measures due to the significant interactive effects each exerts via the utility load curve.
- **Achievable Potential:** We will then apply DR program uptake curves based on the Lawrence Berkeley National Laboratory empirical DR propensity curves to determine the market potential for each DR measure.

We will develop an optimized maximum potential scenario that applies the highest feasible customer incentives for DR program potential, but curtails incentives under cases where

further increases in compensation lead to little or no further DR potential (due to the asymptotic nature of the DR propensity curves applied in the model).

Task 4A: Estimate Potential by Utility Territory

While Rhode Island Energy has the largest service territory in the state, we appreciate that Pascoag Utility District and Block Island Power Company are distinct with their own customers and needs. We will pro-rate the results to each of the smaller utilities' portion of the RI market (which we can easily apply on a segment-by-segment basis) as per the RFP requirements.

Additional Scope Offer: Beneficial Electrification Modeling Update

Should the EERMC be interested, Dunsky can prepare a quote to conduct granular beneficial electrification modeling using Dunsky's industry-leading heat energy decarbonization (HEAT™) model and/or our EV Adoption Model (EVA). This analysis would help improve the precision of electricity and gas impacts in the state and would also provide valuable inputs to update the DR potential results. A description of each model can be found in Appendix B. Should the EERMC be interested, the scope and budget of this additional effort can be discussed during the MPS kick-off.

Project Management Tasks

We apply Project Management best practices by following project-appropriate adaptations of the Project Management Institute's Global Project Management Standard to ensure consistent quality through the application of the project management process groups, including effective initiation and stakeholder identification, and efficient project execution, control and monitoring functions. From the onset, we will establish a detailed and mutually agreed upon work plan outlining tasks, milestones, deadlines and task leads.

We also build in quality control redundancies to ensure our deliverables always meet the highest standard, using quality assurance checklists and issue trackers to identify and resolve issues. Finally, we apply our document templates to ensure the clarity and consistency of our written materials, as well as a multi-step internal copy editing and feedback process to avoid errors/omissions and keep our reports user-friendly, readable, and clear.

The Gantt chart below outlines our proposed timing for key study activities and tasks. Based on the strength of our experience potential study team and database of applicable tools, we are confident that we can meet the study final reporting deadline of March, 2023, with some slight adjustments to interim milestones. In particular, our model calculates all levels of potential (technical, economic, and achievable) simultaneously. As such, we will load all data in the model and perform our extensive QA/QC process on the results prior to delivering the Interim (draft) Results.

Our timeline assumes that all updated input data (TRM, customer data, AECS data, program data) can be obtained within 4- weeks of the data request submittal. If data does not largely conform to this assumption, the timeline will be impacted.

The Gant chart below provides an overview of the proposed project schedule covering all required milestones and deliverables, including delivery of the:

- Draft and Final Measure List
- Draft and Final Workplan
- Draft (interim) and Final Results Presentations
- Draft and Final narrative Report including Graphical Executive Summary and detailed results tables.

Gantt Chart of Key Tasks and Deliverables.

Task	Aug		Sept		Oct		Nov		Dec		Jan		Feb		Mar	
	1	*2*	*1*	*2*	*1*	*2*	*1*	*2*	*1*	*2*	*1*	*2*	*1*	*2*	*1*	*2*
Task 1: Identify data sources and collect input data		D1. Data Request														
Task 2: Estimate net effects of factors affecting baselines																
Task 3: Update measure list and gather data		D3. Measure list														
savings																
Tasks 1-3: Kick-off meeting, check-in meetings, and correspondence		Kick off	M	M	M	M	M	M	M	M			M		M	
Tasks 1-4: Reporting and recommendations and deliverables		D2a. Workplan		D2b. Final Workplan						D4. Interim Results			D5. Final Results			
													D6. Draft Report		D7. Final Report	D.8 Exec. Sum.

The above timeline assumes a contract signature on or by August 15th. Delays to the start date may cause deliverable dates to shift.

Task 1: Kick-off meeting with MPS Management Team

Within two weeks of contract signing, we will convene a virtual kick-off meeting with the MPS Management Team. Prior to the meeting, we will review the project technical requirements, objectives and data requirements. During this meeting, we will discuss project objectives and priorities, and review/refine project methodology, deliverables, timeline, team roles, and internal communications.

Task 2: Check-in meetings with MPS Management Team twice per month

At the kick-off meeting, we will establish a recurring check-in meeting with the MPSMT twice per month for approximately 30 to 60 minutes to discuss the project status including progress, challenges, and suggested solutions.

Prior to each check-in, we will provide a proposed meeting agenda. After each check-in, we will share meeting notes with the MPSMT.

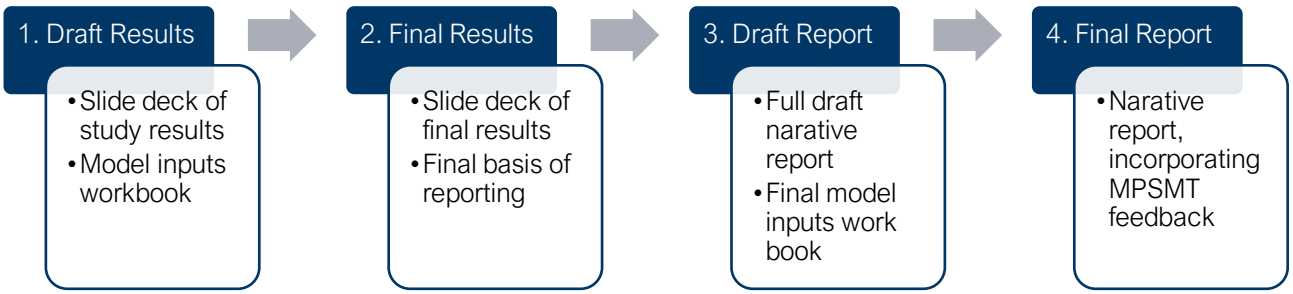
Task 3: Independently manage correspondence with the electric and natural gas distribution company, their consultants, and other data providers in order to fully understand the meaning, contents, and limitations of their data

We will directly correspond with the electric and natural gas distribution companies, their consultants, and other data providers to fully understand the data provided. Dunsky will adhere to all security protocols required by the electric and gas distribution companies.

Reporting Tasks

Task 1: Clearly summarize all data, analysis, and results

We will report the study results in four steps, as per the flow chart below. After each of steps 1-3 the MPSMT will provide Dunsky with consolidated feedback on the reporting documents provided.



Step 1: Interim (Slide deck – web presentation)

Once the analysis and results QA/QC is complete, Dunsky will develop a slide deck that captures the results and analysis of the findings. **We will compare the updated MS results to the prior study results, and provide the rationale and implications of the difference.** This will be delivered during an in-person meeting in Rhode Island (2-3 hours). The slide deck will present savings by fuel, sector, segment, end- use and year covering 2024 to 2026 including:

- **Program Savings:** We will present both cumulative (generation capacity) *and* annual program savings; which can be used as a more accurate read on appropriate targets for each of the coming 3- year plans.
- **Program Budgets:** savings, costs, benefits, for each program in each year.
- **Annual and Lifetime Savings:** annual savings over the 2024-2026 period, as well as lifetime savings that persist beyond the study period.
- **Sensitivity Analysis:** tornado graphs showing the impact (on budgets and savings) of key risk parameters, such as avoided costs, incentive levels, equipment costs, etc.

Note: We will apply the reporting formats and breakdowns as provided in the 2021-2026 MPS, significant adjustments to the report or results reporting structures requested by the client may require scope additions.

Step 2: Final Results (In-person presentation of Slide deck)

Based on MPSMT feedback, and further results QA/QC, we will update the Results slide deck, incorporating feedback related to the analysis and the basis of reporting. We will also add further detail on the implications of the results on DSM programing (recommendations on program delivery strategies, such as the types of program and market segments that can most benefit from enabling approaches; the budget/savings impacts of altering incentive levels; the most cost- effective program mix; etc.)

Step 3: Draft Report

Dunsky will develop a narrative report that documents results of the potential study, following the format and structure of the prior MPS report. We will also provide an appendix that outlines model inputs and assumptions, scenario output tables, and a deeper description of the study methodology, as well as the underlying assumptions for any scenario or sensitivity analysis conducted. The methodology and approach descriptions will largely remain consistent with the prior study, indicating where updates in sources or approaches have been made in the updated report.

We request that the MPSMT provide feedback and proposed edits to the draft report in a single consolidated document within ten working days of receiving the draft report. Barring any unforeseen complications, it is our expectation that a single review and edit phase of the final report will be required.

Step 4: Final Report and Study Materials Hand-over

We will incorporate MPSMT feedback into the Final Report and make all appropriate edits. This will constitute the content review and editing step. After the Final Report is submitted, it is expected that any further edits would cover error corrections only. Within 2-3 days after the Final Report is submitted to the MPSMT, the Final measure workbooks will be provided.

The Final Report will include an Executive summary. Upon acceptance by the MPSMT, this will be converted to the Graphical Executive Summary, as per the contract requirements.

Task 2: Specify program, portfolio, and policy recommendations

We appreciate that the MPS will be a key component in the development of the next three-year energy savings targets and inform specific program elements. We will provide detailed

excel workbooks and tables following the structure used in the prior MPS study to ensure consistency and facilitate use of the results for program planning.

We will provide recommendations on program delivery strategies, such as the types of program and market segments that can most benefit from enabling approaches; the budget/savings impacts of altering incentive levels; the best way to compensate customers to encourage, for example DR strategies; the most cost-effective program mix; etc.

Our recommendations will also reflect our deep understanding of the RI context and historical role energy efficiency has played in the RI context, and insights on how the EE and DR context has change since the prior study was published.

Task 3: Provide all required deliverables in a format acceptable to the MPS Management Team

We will fulfill all reporting requirements outlined in the RFP. Upon completion of the project, we will transfer all study data to the MPSMT. This will include the measure and market characterization databases developed as inputs to the model and the program details, and detailed model outputs and results tables.

Task 4: Hours and invoicing

Hours and invoices will be provided monthly, as per the RFP requirements.

Knowledge and Experience

Dunsky Energy + Climate Advisors supports leading governments, utilities, corporations and non-profits across North America in their efforts to accelerate the clean energy transition, effectively and responsibly. Founded in 2004, Dunsky assesses, designs, and evaluates clients' decarbonization strategies, programs, and plans, drawing on our deep expertise across technologies, industry practices, and innovative market strategies across the U.S. and Canada. Our expertise is focused primarily on buildings/industry, energy, and mobility. Specifically:

- **OPPORTUNITIES ANALYSIS:** We help clients assess technical, economic, and achievable clean energy opportunities, including energy efficiency, renewables, alternative fuels, and the electrification of buildings, transportation, and industry. Our technology assessments, market insights and dedicated models define what is possible, and at what cost and benefit.
- **STRATEGIES & POLICIES:** We help our clients develop effective strategies and policies to accelerate adoption of clean energy opportunities. We advise clients on strategic planning, including defining policy, regulatory and evaluation frameworks, setting goals, determining first principles, choosing threshold criteria, measuring results, and establishing effective management and delivery infrastructures. We design the programs, plans and strategies that will effectively move markets, at scale.

- **EVALUATION & IMPROVEMENT:** We evaluate performance of market strategies to help clients achieve their goals and enhance their offerings moving forward. We also benchmark performance, identify gaps and advise clients on changes – whether new technological options to encourage or new strategies to deploy – to ensure that investments deliver on expectations.

For nearly 20 years, Dunsky has developed a broad array of low-carbon strategies, ranging from very deep, bottom-up opportunity assessments to light, top-down reviews. In the past five years alone, Dunsky has successfully delivered over 20 potential studies across the U.S. and Canada—which have been proven to withstand the toughest regulatory scrutiny, in the toughest regions. Our approach assesses the full array of programs an integrated fashion, with the most rigorous modelling capabilities and the most defensible methods available—to allow for nuanced policy-making and program development. All of these assessments have required defining detailed penetration and saturation statistics for each measure and characterizing existing and emerging technologies, including developing detailed inputs to assess their cost-effectiveness.

Examples of Prior Work and References

In addition to conducting the 2021-202MPS for the EERMC, Dunsky has recently conducted a number of other industry-leading potential assessments in the North east. Below are client references for three recent Dunsky projects.

Project #1	Eversource Energy- Integrated Potential Study for Massachusetts
Contact Name	Tracy Dyke-Redmond, Snr Analyst, Energy Efficiency
Contact Information	781-441-3389; tracy.dyke-redmond@eversource.com
Duration	May 2020 – April 2021 (Previous study: 2017-2018)
Offeror's Role Dunsky (prime) conducted an integrated all-fuels potential study for Eversource's service territory for the years 2022 -2024, covering all sectors (residential, commercial, industrial) and including focus on demand-response, heating electrification, and EV adoption. This study built on our 2017-2018 potential study for Eversource, for which we conducted primary research, characterized measures and markets, and developed efficiency potentials (gas and electric), with a specific inclusion of emerging technologies.	

Project #2	Cape Light Compact – Integrated Potential Study for Massachusetts
Contact Name	Phil Moffitt, Planning & Evaluation Manager
Contact Information	508-744-1279; pmoffitt@capelightcompact.org
Duration	April 2020- September 2021 (Previous study: 2017-2018)
Offeror's Role As subcontractor to Opinion Dynamics Corporation (ODC), Dunsky was responsible for the modeling and reporting of technical, economic and achievable potentials. This work built on our 2017-2018 all-fuels potential study for CLC, and included assessment of potential across all sectors (residential, commercial, industrial) for the 2022-2024 period with added focus on heating electrification and demand-response.	

Project #3	NHSaves – Integrated Potential Study for New Hampshire
Contact Name	Mary Downes, Manager of Administration and Compliance, Energy Efficiency
Contact Information	603-294-5122; downesm@unitil.com
Duration	July 2019- December 2020

Offeror's Role

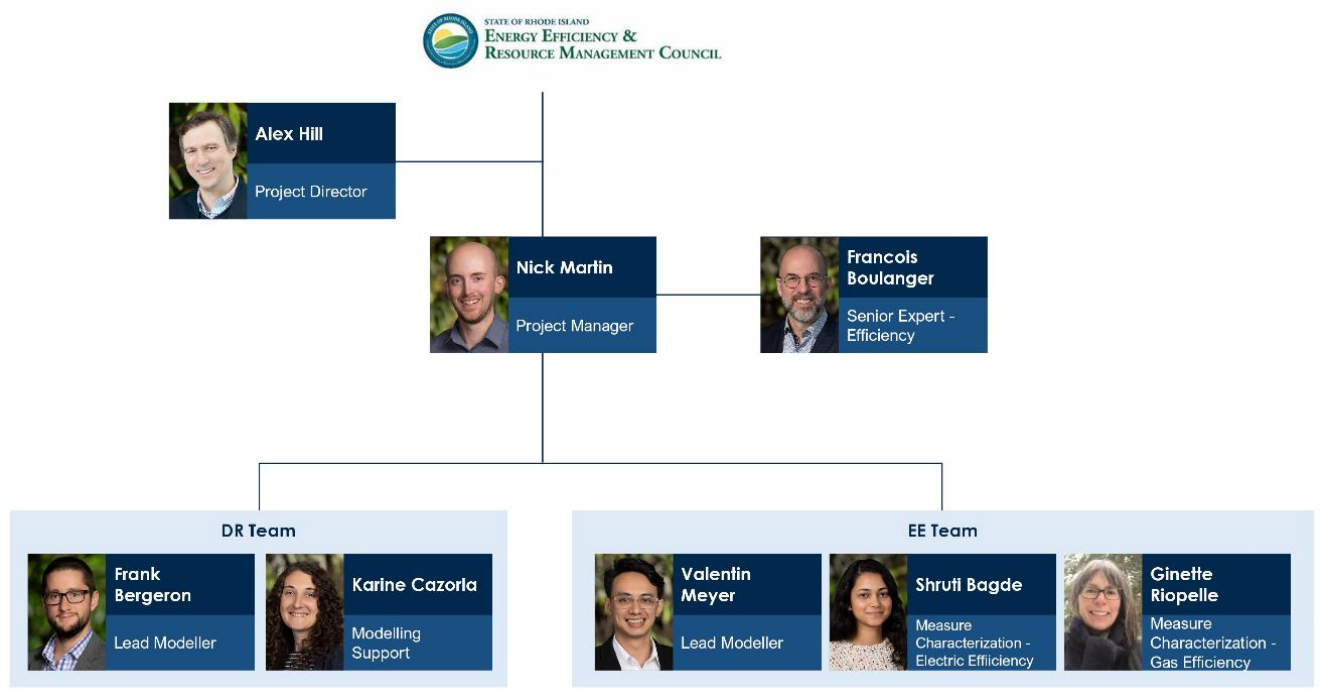
As the primary contractor, Dunsky conducted an energy efficiency and demand response potential study across the state of New Hampshire for the 2021-2023 period to inform the state's DSM programs. The scope included all sectors (residential, commercial, industrial) and electricity, natural gas, and delivered fuels (fuel oil, propane, kerosene, and biomass). The study characterized baseline conditions in the state, quantifying the saturation, penetration, and usage behavior data for critical electric and gas appliances, mechanical equipment, and electronics. To support the study, Dunsky conducted a detailed residential baseline study, in partnership with Itron, using an innovative remote virtual audit; a barriers survey with non-residential customer; and developed a commercial baseline assessment using Dunsky's market archetype.

Key Personnel: Experience and Responsibilities

Dunsky Energy + Climate Advisors

We handpicked a team of technical experts and strong project management professionals to drive this work, as shown in the figure below. For this project, **Nick Martin** will serve as the Project Manager, guided by **Alex Hill** as Project Director. Both Nick and Alex have decades of successful project management experience in leading large-scale potential studies such as the one proposed here—including the earlier study conducted for EERMC. These individuals will be touch points on the project, provide strategic guidance to the team, and leverage their years of expertise to guide the work and ensure a responsive team as questions and needs arise on the project. The day-to-day work will be carried out by our team of energy efficiency and demand response (DR) analysts, including our Lead Efficiency Modeler, **Valentin Meyer**, our EE Measure Characterization Analysts, **Shruti Bagde** and **Ginette Riopelle**, and our DR Modellers, **Frank Bergeron and Karine Cazorla.** Throughout the project, subject matter expertise will be provided by our senior efficiency expert, **François Boulanger.** Bios for these key staff are provided in the next section, with resumes for the full project team provided in Appendix A.

Figure 1. Dunsky Team Structure



Team Bios

Alex Hill (Project Director) has over 20 years' experience leading clean energy and energy efficiency initiatives, through which he has performed a wide range of opportunity

assessments, program and policy designs, and program evaluations. He leads Dunsky's Opportunity Assessment practice, focused on delivering industry-leading potential studies that quantify the technical, economic, and achievable potentials for energy efficiency, demand response, heating electrification, solar PV, and electric vehicles. In this role, he has recently served as Project Director on potential studies for Massachusetts (Eversource Energy, Columbia Gas, and Cape Light Compact), Rhode Island, New York (Long Island), New Hampshire, Illinois, Idaho, Newfoundland/Labrador, New Brunswick, Manitoba—among others. Alex has spearheaded a range of strategic initiatives for clients including: leading Dunsky's role in evaluating over 20 EE financing programs in California, advising the State of Rhode Island on how to optimize efficiency programs, and assessing the business case and designing financing programs for various energy efficiency and distributed renewables initiatives.

Nick Martin (Project Manager) has nine years of experience in climate and energy policy. At Dunsky, Nick has helped clients assess potential across industrial, commercial, and residential sectors for multiple saving streams and technologies, including managing several potential studies for utilities in Massachusetts that included energy efficiency, heating electrification, and electric demand response; coordinating the recent potential study for the State of Rhode Island, which included energy efficiency, CHP, heating electrification, demand response, and behind-the-meter solar; leading the heating electrification component of a potential study in Newfoundland and Labrador; and contributing to assessing EV adoption potential for a utility in Western Canada. He is currently managing a province-wide market potential study on behalf of Efficiency Manitoba covering all sectors and addressing electric and natural gas energy efficiency, fuel switching, distributed generation, electric demand response, and electric vehicles.

Francois Boulanger (Senior Expert – EE) brings 24 years of experience in sustainable energy and engineering. He provides in-depth knowledge of energy efficiency programs, portfolio and strategies spanning the residential, commercial, and industrial sectors. He is the Senior Technical Lead on most of Dunsky's potential studies, providing guidance from the high-level interpretation of savings, down to ensuring the quality and accuracy of the specific savings and market inputs. He has characterized energy efficiency measures and conducted various market assessments studies in the Northeast and recently led potential studies for Eversource Energy (MA), Columbia Gas of Massachusetts, Rhode Island Energy Efficiency & Resource Management Council (EERMC), NHSaves (New Hampshire), and Intermountain Gas Company (IGC)— among others. François also led a market assessment and technology review to identify untapped opportunities for a leading DSM administrator in the Northeast, as well as a GHG intensity study for a Canadian gas utility to define its role in decarbonizing British Columbia's new construction and retrofit sectors.

Frank Bergeron (DR Lead Modeller) is an energy enthusiast with seven years of experience in the sector. Since joining Dunsky, he has contributed to demand-side management and renewable energy projects. He developed Dunsky's DROP™ model used to assess distributed energy resources potential and has applied it to multiple jurisdictions

across the United States and Canada. Namely, he has contributed to seven potential studies across North America, worked on program evaluation, and supported the development of KPIs and roadmaps to set our clients on a path towards being a top demand-side management performer. Frank worked on renewable energy projects ranging from evaluating solar deployment opportunities, creating factsheets for municipalities looking to promote or install renewables, modelling the impact of policies and incentives on distributed solar, and comparing supply-side levelized cost of energy for renewables.

Karine Cazorla (Modelling Support – DR) brings eight years of experience in engineering, data analysis and project management in the area of sustainable energy and building efficiency. As an engineering and business management graduate, she leads projects as varied as demand response program design, assessment of leading-edge energy efficiency technologies, and program evaluation. Since joining Dunsky, she has performed DR potential assessments for North Carolina (Duke Energy), Massachusetts, Rhode Island, New Hampshire, Prince Edward Island, Nova Scotia, New Brunswick, Newfoundland/Labrador, Yukon, and Sherbrooke. This work has included the development on tailored DR strategies, peak load impact and cost-effectiveness analysis. Before joining Dunsky, Karine collaborated with various electricity suppliers in North America to help municipalities transition to LED lighting systems, by combining energy savings and financing options. Determined to accelerate the energy transition, she is also chair of one of the Canada Green Building Council, Quebec Chapter Committee and contribute to numerous energy-related events.

Valentin Meyer (Lead Modeller – EE) brings five years of experience in sustainable energy initiatives, energy efficiency financing programs, demand-side assessment, and remote-grid microgrids. He is Dunsky's lead modeller of the Dunsky Energy Efficiency Potential (DEEP) model, and is currently supporting an energy efficiency and distributed energy resources (DERs) potential study for the province of Manitoba, addressing the industrial, commercial, and residential sectors. He has also been involved in other projects with utilities, municipal-, provincial- and federal governments, financial institutions, research institutions, building management companies, project developers and non-profit organizations across Canada and the U.S. with a focus on assessing and evaluating renewable energy and energy efficiency programs and policies.

Shruti Bagde (Measure Characterization – Electric Efficiency) is a senior analyst who brings two years of experience in energy efficiency, data management, data analytics and quality control. While at Dunsky, she has proven her strong technical background in energy efficiency and played a key role in vast potential studies for utilities in North America. Her work has focused on characterizing measures and working with Dunsky's DEEP model to produce results surrounding technical, economic, and achievable potential. Shruti hold's a bachelor's degree in mechanical engineering, but an interest in a sustainable future led her to complete a master's degree in sustainable energy from the University of Toronto. While there, she gained valuable experience in performing energy audits, finding energy efficiency opportunities, and participating in coding challenges to create smarter cities.

Ginette Riopelle (Measure Characterization – Gas Efficiency) is a professional mechanical engineer with over 25 years of experience and a doctor's degree in mechanical engineering from the University of Waterloo. A Certified Measurement and Verification Professional (CMVP) and Certified Energy Manager (CEM), her experience in the energy sector started as a consultant for the mechanical department of a research institute specializing in electricity. She later managed energy efficiency projects—more specifically, energy analyses of commercial and industrial buildings and feasibility studies—for engineering consulting firms. She also acted as a team manager in a technology center specializing in natural gas, where she also served as project manager for on-site and laboratory evaluation activities, and for the development of energy efficiency programs.

Additional Submission Requirements

Conflicts of Interest

Our completed Conflict of Interest form can be found in Appendix C.

Litigation

Dunsky hereby confirms that there exists no litigation, disputes, claims or complaints, or events of default or other failure to satisfy contract obligations, or failure to deliver products involving offeror or an affiliate of offer, and relating to providing services similar to the services being solicited by the EERMC.

Investigation

Dunsky hereby confirms that we, and the directors, employees and agents of offeror and any affiliate of offeror are not currently under investigation by any governmental agency and have not in the last four years been convicted or found liable for any act prohibited by state or federal law in any jurisdiction involving conspiracy, collusion or other impropriety with respect to bidding on any contract.

Appendix A: CVs

Team CVs are presented in the following order:

- Alex Hill
- Nick Martin
- Francois Boulanger
- Frank Bergeron
- Karine Cazorla
- Valentin Meyer
- Shruti Bagde
- Ginette Riopelle

Alex J. Hill

MEng, PMP, LEED AP

PARTNER

Alex Hill has over 20 years' experience leading clean energy and energy efficiency initiatives, through which he has performed a wide range of opportunity assessments, program and policy designs, and program evaluations. He leads Dunsky's Opportunity Assessment practice, focused on delivering industry-leading potential studies that quantify the technical, economic, and achievable potentials for energy efficiency, demand response, heating electrification, solar PV, and electric vehicles. In this role, he has recently served as Project Director on potential studies for Massachusetts (Eversource Energy, Columbia Gas, and Cape Light Compact), Rhode Island, New York (Long Island), New Hampshire, Illinois, Idaho, Newfoundland/Labrador, New Brunswick, Manitoba—among others. He also led other technical studies in the State of Massachusetts, including earlier energy efficiency potential studies, a recent analysis of non-wires alternatives (NWA), and a study to assess weatherization technologies for the C&I sector. He recently advised on a GHG intensity study for a Canadian gas utility to define its role in decarbonizing British Columbia's new construction and retrofit sectors, and led a market research study for NYSERDA to understand financial solutions to increase adoption of renewable heating and cooling systems. Alex has spearheaded a range of strategic initiatives for clients including: leading Dunsky's role in evaluating over 20 EE financing programs in California, advising the State of Rhode Island on how to optimize efficiency programs, and assessing the business case and designing financing programs for various energy efficiency and distributed renewables initiatives.

PROFESSIONAL EXPERIENCE

2012- DUNSKY ENERGY + CLIMATE ADVISORS

Managing Partner (2015-Present)
Senior Consultant (2012-2015)

- Leads Dunsky's Energy Efficiency Financing, and Renewables and Demand Response service areas, directing internal teams to meet client needs for projects focused on these subjects.
- Served as Project Director on Dunsky's All-Fuel Efficiency and/or Distributed Energy Resources (DER) Potential Studies for Eversource Energy, Columbia Gas of Massachusetts, NHSaves, Rhode Island, New Brunswick Power, and others—covering industrial, commercial, and residential sectors and including assessment of heating electrification, DR/peak, solar PV + storage, transportation electrification, and/or CHP.
- Led Dunsky's Assessment of Electric Efficiency Potential Study for PSEG Long Island; this 20-year study considers demand response/peak measures, forecasted changes in codes and standards, electrification measures such as heat pumps, and solar PV adoption.
- Led a market research study for NYSERDA to understand financial solutions to increase adoption of renewable heating and cooling systems, involving interviews with over 45 market experts across NY state.
- Advise on a GHGi study for FortisBC as part of its Buildings Sector Strategy Roadmap to define its role in British Columbia's decarbonizing new construction and retrofit sectors
- Performed measures characterization and savings specifications for the OPA and to support other residential and commercial incentive programs.

- Lead for strategic support on financing program effectiveness and design to the State of Rhode Island Energy Efficiency Resource Management Council (EERMC).
- Performed interviews and analysis for the impact and process evaluation of PACE Home Energy Efficiency Loans program for Efficiency Maine.
- Lead for Dunsky's role in the impact evaluation of some 20 EE/RE financing pilots and programs in California: performing market characterization and baseline analysis, developing interview guides, survey tools and sampling approaches for primary data collection.
- Led a multi-sector strategic consultation process to develop a national commercial sector energy efficiency financing pilot program model (Toronto Atmospheric Fund)
- Led the design of commercial and residential innovative financing for energy efficiency retrofit program for the Clean Air Partnerships (Ontario)
- Designed programs and assessed options for a number of utilities across North America to provide solar PV financing within their service offer.

2009-12 SUSTAINABILITY CONSULTING

- Energy Efficiency Financing Program Development: *Frontier Finance International,* Washington*, DC*
- Environmental policy and management strategy for an international development foundation and its partners, *Le Fondation Léger*
- **Urban Greening Program Evaluation**: *Institute Nationale de Santé Publique de Québec*, *Plan d'action sur les changements climactiques*
- Sustainability planning and management including energy efficiency auditing: *Yellow Pages Group Canada, Hotel Sacacomie, Spa Eastman, Le Massif - Hotel La Ferme*
- Senior Engineering Consultant for BioRegional North America: One Planet Living

2005-10 GREEN ENERGY BENNY FARM

General Manager

- Coordinated the development of the first integrated geo-exchange/solar energy system of its size in Canada (servicing 140 residential social-housing units).
- Established home owner solar energy equipment buyer's groups; business, energy performance contracts; business plans on the potential for geo-exchange and solar energy in Montreal.
- Advised social housing developers on energy efficiency strategies (ON and QC).

2007-09 ECOCITÉ DEVELOPMENTS, MONTREAL, QUEBEC

Project Manager- Canada's first net-zero energy condominium project

2000- 05 ALTERNATIVES INC, MONTREAL, QUEBEC

Environmental Program Manager - initiated rooftop garden project & biodiesel demonstration project

EDUCATION

GRADUATED 2000	**Master of Civil (Environmental) Engineering**	McGill University
GRADUATED 1996	**Bachelor of Chemical Engineering**	McGill University

NICK MARTIN

SENIOR CONSULTANT

Nick Martin has nine years of experience in climate and energy policy. At Dunsky, Nick has helped clients assess potential across industrial, commercial, and residential sectors for multiple saving streams and technologies, including managing several potential studies for utilities in Massachusetts that included energy efficiency, heating electrification, and electric demand response; coordinating the recent potential study for the State of Rhode Island, which included energy efficiency, CHP, heating electrification, demand response, and behind-the-meter solar; leading the heating electrification component of a potential study in Newfoundland and Labrador; and contributing to assessing EV adoption potential for a utility in Western Canada. He is currently managing a province-wide market potential study on behalf of Efficiency Manitoba covering all sectors and addressing electric and natural gas energy efficiency, fuel switching, distributed generation, electric demand response, and electric vehicles. In addition to this work, Nick has helped clients design strategies to maximize clean technology adoption and develop business cases for the deployment of resources such as EV charging infrastructure and advanced metering infrastructure. Prior to joining our team, he spent four years at the Pace Energy and Climate Center in New York, where he focused on demand-side energy policy including co-authoring a review of New York's pre-REV efficiency efforts. Nick holds a master's degree in Climate Science and Policy from the Bard Center for Environmental Policy.

PROFESSIONAL EXPERIENCE

2019 – Present DUNSKY ENERGY + CLIMATE ADVISORS

Senior Consultant

- Led multiple state- and province-wide market potential assessments that included assessments of energy efficiency, demand response, heating electrification, combined heat and power, and distributed generation potential—including for Massachusetts and Rhode Island.
- Developed electric vehicle strategies and business plans for municipal and utility clients, which included modeling electric vehicle uptake, assessing barriers to consumer adoption, and evaluating the energy and financial impacts of increased electric mobility.
- Assisted utility clients with developing a business case for deploying advanced metering infrastructure, evaluating various models for integrating utilities into energy efficiency program delivery, and reviewing portfolio performance and internal team management processes.

2017-19 CANADA WEST FOUNDATION

Policy Analyst

- Led climate and energy policy engagement activities with a focus on electricity, oil and gas, and greenhouse gas emission reduction issues, including analyses of inter-provincial electricity trade in Western Canada and regulatory barriers inhibiting distributed geothermal electricity in Alberta.
- Creatively communicated findings to relevant stakeholders, including government officials, businesses, media and the public via reports, presentations, podcasts, events, blog posts, and opinion articles.

2013-17 PACE ENERGY AND CLIMATE CENTER

Energy Policy Associate

- Conducted qualitative and quantitative research on energy policy issues including rate design, energy markets, and environmental regulations, including rate impacts of distributed solar deployment, marginal emission rates for the bulk power system, and barriers inhibiting combined heat and power deployment.
- Communicated findings to relevant stakeholders including government officials, businesses, and other non-profit organizations via reports, presentations, regulatory filings, and one-on-one conversations.

2014-16 NORTHEAST CLEAN HEAT AND POWER INITIATIVE

Executive Director

- Successfully led the trade organization for over two years including advising Board of Directors, managing policy engagements.
- Increased revenue by expanding membership, securing event sponsorships, and improving event attendance, leading to ability to hire a full-time executive director for first time in organization's history.
- Overhauled organizational structure including updating bylaws, reforming committee structures and roles, and formalizing member relation functions.

EDUCATION

M.Sc., Climate Science and Policy	Bard College	2013
B.Sc., Environmental Health Science	University of Georgia	2011

PUBLICATIONS

Martin, N. (2018). ***Power without Borders: Moving towards an integrated Western grid***. Canada West Foundation.

Martin, N. (2018). ***Hot Commodity: Geothermal electricity in Alberta***. Canada West Foundation.

Spiller, E., Sopher, P., Martin, N., Mirzatuny, M., & Zhang, X. (2017). The environmental impacts of green technologies in TX. ***Energy Economics, 68***, 199-214.

Martin, N., Rábago, K. (2017). ***Retail Rate Impacts of Distributed Solar: Focus on New England***. Pace Energy and Climate Center.

Martin, N. (2015). ***Carbon-Tuning New York's Electricity System***. Pace Energy and Climate Center.

Bowie, J., Gahl, D., Martin, N., & Swanson, S. (2015). ***Charting the Course for Energy Efficiency in New York***. Pace Energy and Climate Center.

Leonhardt, D., Bourgeois, T., Bradford, B., Gerow, J., Martin, N., & Rao, L. (2015). ***Microgrids & District Energy: Pathways to Sustainable Urban Development***. Pace Energy and Climate Center & International District Energy Association.

Bourgeois, T., Gerow, J., Litz, F., & Martin, N. (2014). ***Community Microgrids: Smarter, Cleaner, Greener***. Pace Energy and Climate Center.

Martin, N. (2013). Use of Seasonal Forecast Information in Farm Level Decision Making in Bundelkhand, India. ***Indian Research Journal of Extension Education***, ***13***(2), 93–103.

FRANÇOIS BOULANGER

SENIOR RESEARCH LEAD

Francois Boulanger brings 24 years of experience in sustainable energy and engineering. He provides in-depth knowledge of energy efficiency programs, portfolio and strategies spanning the residential, commercial, and industrial sectors. He is the Senior Technical Lead on most of Dunsky's potential studies, providing guidance from the high-level interpretation of savings, down to ensuring the quality and accuracy of the specific savings and market inputs. He has characterized energy efficiency measures and conducted various market assessments studies in the Northeast and recently led potential studies for Eversource Energy (MA), Columbia Gas of Massachusetts, Rhode Island Energy Efficiency & Resource Management Council (EERMC), NHSaves (New Hampshire), among others. François also led a market assessment and technology review to identify untapped opportunities for a leading DSM administrator in the Northeast, as well as a GHG intensity study for a Canadian gas utility to define its role in decarbonizing British Columbia's new construction and retrofit sectors.

Prior to joining Dunsky, Francois managed a residential energy audit and retrofit program, was the lead engineer for analysis of large-scale industrial processes, and was involved in a range of related activities, from high-level sustainable energy policy analyses to ground-level design of a high-performance (LEED Platinum) commercial office building.

PROFESSIONAL EXPERIENCE

2010 — DUNSKY ENERGY + CLIMATE ADVSIORS, Senior Research Lead

Consulting services in energy efficiency and renewable energy policies and programs

- **PRINCIPAL ACTIVITIES:** Advise clients and lead research projects in the following areas related to energy efficiency, demand response, demand-side renewable energy and other areas of demand-side management (DSM):
  - Cost-effectiveness analysis
  - Cost-effectiveness framework (NTG,spillover, market effects)
  - Non-energy benefits
  - Energy Efficiency, Renewable Energy program design
  - Strategic planning
  - Potential studies
  - Opportunities &Technology analyses
  - Best practices / lessons learned
  - Gap analyses
- **SAMPLE CLIENTS:** Eversource, National Grid, Cape Light Compact, New Brunswick Power, Union Gas, Ontario Power Authority, FortisBC, BCHydro, Efficiency Nova Scotia, Federal Office of Energy Efficiency, Quebec Energy Efficiency Agency, Saskatchewan GoGreen Fund, Newfoundland and Labrador Hydro, among many others.
- **SAMPLE PROJECTS:**

Market & Opportunity Studies

- Senior Research Lead for energy efficiency and/or DER potential studies (*Eversource, 2020-2021, 2017-2018; Columbia Gas, 2020-2021, 2017-2018; Rhode Island, 2019-2020; New Hampshire, 2019-2020; Intermountain Gas Company, 2018-2019; Iowa Utilities, 2016-2017; Atco Gas, 2015; Cape Light Compact – 2014/15*)

- Technical lead on assessing the potential savings, costs, and forecasted market roll-out for natural gas-fired heat pumps in the immediate, medium, and long-term (*Confidential Gas Utility, 2021*)
- Conducted market research to identify new short term natural gas energy efficiency opportunities *(Northeast Utilities, 2014)*
- Conducted a Portfolio-wide Optimization Analysis (*Manitoba Hydro, 2016)*

DSM/EE Program Design

- Designed energy efficiency incentive programs (including full measure characterisation and cost effectiveness analysis) (*NB Power, OPA, BC Hydro, Fortis BC, Efficiency Nova Scotia, Newfoundland and Labrador Hydro / Newfoundland Power*)
- Led best practices review on energy conservation program design (*Quebec's Energy Efficiency Agency, Fortis BC, BC Hydro, ENSC, Saskatchewan MoE)*
- Led development of the initial version of NB Power's Technical Reference Manual for the residential sector *(NB Power – 2014/15*)

Policies & Strategic Advice

- Led an analysis of geo-targeted DSM benefits and developed a cost-effectiveness methodology (*National Grid – 2015)*
- Provided strategic counsel, review and analysis of cost-effectiveness framework and other matters (*Efficiency Nova Scotia – 2012-2014, 2015*)
- Researched, analysed and advised on Resource Planning framework and DSM as an alternative to capital investments *(Union Gas – 2014)*

PRIOR EXPERIENCE (1997-2009)

ÉQUITERRE, Director – Energy, Building and Transportation (Environmental NGO)

- Management of campaigns, projects, services and activities on energy efficiency, ecological transportation and sustainable building (planning human, financial and material resources)
- Owner's representative during a LEED Platinum building design process, notably throughout the integrated design process
- Management of residential energy efficiency audit activities for both general retrofit and low-income retrofit programs

HONEYWELL PROCESS SOLUTIONS, Lead Engineer

EDUCATION

Bachelor's in Applied Sciences École Polytechnique de Montréal 1997
Faculty of engineering

FRANK BERGERON

TECHNICAL LEAD

Frank Bergeron is an energy enthusiast with seven years of experience in the sector. Since joining Dunsky, he has contributed to demand-side management and renewable energy projects. He developed Dunsky's DROP™ model used to assess distributed energy resources potential and has applied it to multiple jurisdictions across the United States and Canada. In energy efficiency, he contributed to seven potential studies across North America, worked on program evaluation, and supported the development of KPIs and roadmaps to set our clients on a path towards being a top demand-side management performer. Frank worked on renewable energy projects ranging from evaluating solar deployment opportunities, creating factsheets for municipalities looking to promote or install renewables, modelling the impact of policies and incentives on distributed solar, and comparing supply-side levelized cost of energy for renewables. Prior to joining us, Frank worked on solar and wind energy forecasting, creating innovative and industry-rooted energy solutions, such as developing R&D projects and new models to increase value and answer specific client challenges. He gained valuable experience in big data analytics & machine learning, renewable energy modeling and renewable energy policy.

PROFESSIONAL EXPERIENCE

2018 – Present **DUNSKY ENERGY + CLIMATE ADVISORS, Technical Lead**
Consulting services in energy efficiency and renewable energy policies and programs

Demand-Side Management and Demand Response

- Developed and maintain a demand response potential model used in Ontario, Manitoba, Newfoundland, Prince Edward Island, Rhode Island, New Hampshire, Massachusetts, North and South Carolina
- Worked on eight EE potential studies, characterizing residential energy efficiency and fuel switching measures, cleaning and reviewing penetration and saturation data, and helping model energy efficiency potential in multiple jurisdictions in Canada and the United States.
- Supported the development of scorecards and roadmaps to set our clients on a path towards being a top DSM performer in Manitoba and New Brunswick

Solar Adoption & Renewables

- Forecasted distributed solar adoption and direct job creation in Nova Scotia for CanSIA
- Modelled multiple solar and storage market outlooks in Ontario, Alberta, California, New Brunswick, Rhode Island under various markets and policy scenarios
- Helped developed solar and wind power factsheets across municipalities in Canada
- Forecasted levelized cost of renewable energy in Quebec

Program Design and Evaluation

- Gathered and analyzed data to support a program evaluation for Energy Efficiency Alberta
- Evaluated energy savings and GHG reductions in a set of programs for Alberta's municipalities
- Completed the evaluation of an energy efficiency program (boilers) performance, including free ridership, spillover, etc. for Gazifère.

2015-18 WPRED INC, Energy Analyst & Business Development Manager
Company specialized in wind and solar power forecasts

- Processed and analyzed energy production and electrical grid data of solar and wind farms
- Presented technical reports to assets & operations managers
- Developed three new solar and wind energy models new and efficient tools for data analysis
- Managed interns and R&D projects, both industrial and academic
- Worked closely with clients to ensure that their needs were met and that their projects were delivered on time and to high level of satisfaction
- Developed and maintained strong business relationships with key players in the industry
- Kept abreast of relevant renewable energy policies in Canada, US & Europe and adapted client solutions accordingly
- Increased revenue by over 10% per year

2012-13 POLYTECHNIQUE MONTREAL, Teaching Assistant & Research Assistant
Engineering University

- Developed a database of advanced physical phenomena, with applications, for 1st year students
- Monitored students and taught the physical principles throughout the development of the applications associated with the database
- Taught students how to use COMSOL Multiphysics (a finite element software)
- Characterized common radiofrequency measuring instruments using high-performance radio communication materials

2013 BRIDAGE-ELECTRO URBAINE, Technical Manager
Non-for-profit organization which aims to characterize radiofrequencies in the environment

- Characterized radiofrequencies in various public sites and in private houses
- Collaborated with stakeholders, ranging from local community organizations & media to home owners, to establish local awareness and ensure the sustainability of the organization
- Ordered equipment and managed measurement requests
- Managed and planned the work of undergraduate students

EDUCATION

M. Eng, Energy Engineering	Polytechnique Montreal, Canada	2014
B. Eng, Physics Engineering	Polytechnique Montreal, Canada & KTH - Royal Institute of Technology, Sweden (1 year)	2013

KARINE CAZORLA

SENIOR ANALYST

Karine Cazorla brings eight years of experience in engineering, data analysis and project management in the area of sustainable energy and building efficiency. As an engineering and business management graduate, she leads projects as varied as demand response program design, assessment of leading-edge energy efficiency technologies, and program evaluation. Since joining Dunsky, she has performed DR potential assessments for North Carolina (Duke Energy), Massachusetts, Rhode Island, New Hampshire, Prince Edward Island, Nova Scotia, New Brunswick, Newfoundland/Labrador, Yukon, and Sherbrooke. This work has included the development on tailored DR strategies, peak load impact and cost-effectiveness analysis. Before joining Dunsky, Karine collaborated with various electricity suppliers in North America to help municipalities transition to LED lighting systems, by combining energy savings and financing options. Determined to accelerate the energy transition, she is also chair of one of the Canada Green Building Council, Quebec Chapter Committee and contribute to numerous energy-related events.

Guided by a desire to create a healthy and sustainable environment, Karine obtained an engineering diploma in energy, buildings and environment, which included the study of biomass in Sweden. She completed her academic training with a Master's in business administration.

PROFESSIONAL EXPERIENCE

2016 – Present **DUNSKY ENERGY + CLIMATE ADVISORS, Senior Analyst**
Consulting services in energy efficiency and renewable energy policies and programs

- Led a residential demand response program design for smart thermostat and electric water heater controller for Yukon Energy and developed their EM&V 2.0 evaluation plan.
- Led a winter-specific DR potential assessment for Duke Energy in North Carolina and South Carolina.
- Performed DR potential studies in Massachusetts, Rhode Island, New Hampshire, Prince Edward Island, Nova Scotia, New Brunswick, Newfoundland/Labrador, and Sherbrooke.
- Supported a cost-benefit analysis and five case studies to assess the value proposition of demand response strategies in the C&I sectors for Hilo, a Hydro-Quebec branch.
- Contributed to the development of a program planning calculator to estimate and track energy efficiency and demand response achievements and calculate program cost-effectiveness metrics for Ecofitt.
- Performed energy efficiency and fuel switching potential studies including measure and market characterization, cost-effectiveness analysis and modelling for various Canadian and American utilities
- Conducted market research to identify new energy efficiency opportunities for large utilities and assessed the technical, economic and achievable energy efficiency potential of these measures.

- Contributed to the assessment and optimization of Hydro-Sherbrooke's demand response strategies
- Performed the review of a program related to incentives for VRF heat-pumps in Nova Scotia, specifically in new construction MURBs where natural gas is available, which included a jurisdictional scan, interviews with local market actors and building energy simulations.
- Developed a full measure and market characterization for residential, commercial and industrial sectors for Massachusetts utilities
- Performed a demand response potential study including measure and market characterization, cost-effectiveness analysis and modelling for various Canadian utilities
- Performed a cost-benefice analysis of Clean Nova Scotia's low-income program
- Developed sections of NB Power's Technical Reference Manual for the commercial and industrial sector
- Performed technical reviews of Local Distribution Companies' participant incentive applications for the Ontario's Independent Electricity System Operator
- Conducted a review of the Bioenergy Program, with a focus on its impact, efficiency and effectiveness, for Alberta Innovates
- Analysed the feasibility of developing a consumer products program for a large utility. The work included a jurisdictional scan and a market study examining future trends in the energy efficient products market
- Contributed to the design of a direct-install program for the multi-family sector for Energy Efficiency Alberta
- Developed sections of NB Power's Technical Reference Manual for the commercial and industrial sector
- Conducted market research to identify new energy efficiency opportunities for a large utility and assessed the technical, economic and achievable energy efficiency potential of these measures
- Prepared a high-level study to evaluate the key barriers, strategies and innovative financing solutions to adopting geo-exchange systems at utility scale

2015-16 REALTERM ENERGY, Energy Efficiency Specialist

Company specialized in implementation of LED streetlight systems

- Evaluated the energy and cost savings resulting from lighting and lighting control retrofits.
- Collected and analyzed energy data in order to help clients through their decision-making process.
- Developed models to determine clients' financing options
- Accompanied clients in obtaining the appropriate incentive
- Wrote energy consumption and financial reports as well as project close-out reports
- Reviewed and responded to national and international requests for proposals

2014-15 SYDEEL 66 *(SYNDICAT DÉPARTEMENTAL DE L'ÉCLAIRAGE ET DES ÉNERGIES)*, Energy Efficiency Consultant

Consulting services in energy efficiency and renewable energy for its members

- Performed energy audits (measures, analysis, savings calculation, implementation costs) for different buildings types.
- Conducted thermal studies and energy performance certificates
- Identified and prioritized energy saving opportunities

- Participated in the implementation of energy saving projects: evaluated consumption and evolution, organized energy commissions and wrote preliminary reports
- Consulted with local authorities and provided assistance with energy efficiency projects

2012 **ETB, Thermal Design Engineer**
Engineering office focused on thermal energy applied to residential and commercial buildings

- Calculated heat loss from new and retrofitted buildings
- Designed solutions for the building envelop and all the building related systems (insulation, heating, ventilation, water heater, energy production).
- Ensured that suggested solutions respected regulations and certifications

ADVISORY COMMITEES AND BOARDS

2014 - **Engineering association Francogénie**, Sustainable development administrator

2015 - **Canada Green Building Council (QC)**, President of the expert education committee

EDUCATION

M.Sc., Management and Business Administration	Institut d'Administration des Entreprises Annecy, France	2013
M.Sc., Energy, Building and Environmental Engineering	Engineering school Polytech Chambéry, France Högskolan i Borås, Sweden (7 months)	2012

VALENTIN MEYER

PRINCIPAL ANALYST

Valentin brings five years of experience in sustainable energy initiatives, energy efficiency financing programs, demand-side assessment, and remote-grid microgrids. He has been involved in various projects with utilities, municipal-, provincial- and federal governments, financial institutions, research institutions, building management companies, project developers and non-profit organizations across Canada and the U.S. with a focus on assessing and evaluating renewable energy and energy efficiency programs and policies. Val is Dunsky's lead modeller of the Dunsky Energy Efficiency Potential (DEEP) model, and is currently supporting an energy efficiency and distributed energy resources (DERs) potential study for the province of Manitoba, addressing the industrial, commercial, and residential sectors. Prior to joining Dunsky, he worked as an analyst for an energy consulting firm focusing on driving operational energy savings in industrial and institutional facilities across North America. He also worked at an energy research institute based in Singapore, where he was part of the team that built South-East Asia's largest off-grid microgrid test and demonstration platform, gaining experience in the planning and installation of solar photovoltaics, wind turbine, energy storage, and microgrid controllers. Valentin holds a bachelor's degree in civil engineering from Monash University, Australia, and has completed a master's degree in clean energy engineering and business management from the University of British Columbia.

PROFESSIONAL EXPERIENCE

2020 – Present **DUNSKY ENERGY + CLIMATE ADVISORS**
Principal Analyst

Modelling Assessments - Potential Studies and Other Clean Energy Projects

- Leads modelling for Dunsky's potential model (DEEP); currently supporting an energy efficiency and distributed energy resources (DERs) potential study for the province of Manitoba.
- Modelled and evaluated the potential of renewable energy solutions for ten remote-grid NunatuKavut communities in central and southern Labrador to offset diesel consumption and reduce GHG emissions.
- Modelled and evaluated the potential of renewable energy micro-grids serving 36 remote communities in British Columbia to help reach the province's goal of reducing GHG emissions from diesel electricity generation in remote communities by 80% by 2030 relative to 2019. Quantified the associated costs with varying energy generation and energy storage technologies.
- Modelled a long-term market-level analysis for a Canadian utility to assess the GHG reduction potential of residential and commercial building retrofits, as well as the impact of renewable natural gas to meet various provincial GHG reduction targets.

Energy Efficiency Financing

- Supported the development of an energy efficiency financing program model for a provincial government to evaluate financing solutions for building energy retrofits in the residential and commercial sectors.

- Supported the development of a Canada-wide landmark financing initiative by modelling GHG reduction potential and associated costs of building energy retrofits in privately-owned commercial, institutional, and industrial buildings.
- Assessed potential market size, develop archetypical retrofit packages, and modeled energy efficiency financing program for five municipalities in Ontario, Quebec, and Northwest Territories.
- Led the development of an improved energy efficiency financing program model by assessing past energy efficiency financing program uptakes across North America.
- Led the development of a tool to streamline the creation and analysis of retrofit packages for archetypical houses for the purpose of modeling potential impacts of energy efficiency financing programs.

Others

- Assessed demand savings and greenhouse gas reduction potential from fuel switching and energy efficiency measures for the remote-grid Gitga'at First Nation community of Hartley Bay; developed a customizable calculator tool for use by other Non-Integrated Areas in British Columbia to estimate demand-side management energy and emissions reduction potential.
- Conducted a jurisdictional scan on industrial tariffs applicable to renewable generation assets in five Canadian provinces to support an analysis of the appropriate rate structure for an independent power producer.
- Assisted the presentation of a new low-carbon residential district development to city officials by quantifying the potential reduction of energy use, peak demand and life-cycle embodied carbon of the proposed district compared to typical homes.

2019-20 ENERGY PERFORMANCE SERVICES

Energy Analyst

- Delivered Energy Management Information System (EMIS) audits for two paper manufacturers in Canada, assessed energy savings opportunities via changes in operational procedures with a total potential savings of 4.4 GWh of electricity & 48 TJ of gas.
- Conducted Strategic Energy Management (SEM) programs for six automotive manufacturers in the U.S: held weekly meetings, assessed and quantified low-cost no-cost energy savings opportunities, and assisted clients in implementing procedural changes to ensure continuous improvement.
- Written four Measurement and Verification (M&V) reports for diverse industrial clients across North America in accordance with SEP M&V and IPMVP protocols to report on their achieved energy savings to program administrators and regulators.
- Designed and delivered various custom energy dashboards and energy planning tools for industrial clients with references to ISO 50001.

2015-17 ENERGY RESEARCH INSTITUTE AT NANYANG TECHNOLOGICAL UNIVERSITY

Project Engineer

- Designed, scheduled, installed, and commissioned two remote off-grid hybrid microgrid systems as part of South-East Asia's largest microgrid research, development & demonstration facility in collaboration with Singaporean government agencies and multi-national industrial partners.
- Collaborated with key stakeholders in integrating 630 kWp solar photovoltaics, 100 kW wind turbine, 600 kWh Li-ion batteries, 200 kVA diesel generators, microgrid controllers and various end use of energy.

- Written, reviewed, and negotiated various-sized tenders with a sum of USD 2.1 million in accordance with Singaporean regulations.

2013 & 2014 **ELECTRICITÉ DE FRANCE, Laboratoire National d'Hydraulique et Environnement**
Research Internship

- Led the writing of a technical note for an in-house software module to calculate river sediment discharge and conducted a numerical analysis on the evolution of sediment discharges due to the addition of hydroelectric dams on a river section in France.
- Drew contour lines during the construction phase of two hydroelectric dam's physical models in the laboratory's warehouse: one 1:40 scaled hydroelectric dam model and one 1:8 scaled fish pass model attached to a hydroelectric facility.
- Conducted a 3D analysis on the evolution of river sediment discharge on a 1:40 scaled model of a river section in France by stitching together 3D scan results to create digital versions of the physical model.

EDUCATION

MEL, Clean Energy Engineering	The University of British Columbia, Vancouver, British Columbia	2018
B.Eng., Civil Engineering	Monash University, Australia	2014

SHRUTI BAGDE

SENIOR ANALYST

Shruti Bagde is a senior analyst who brings 2 years of experience in energy efficiency, data management, data analytics and quality control. While at Dunsky, she has proven her strong technical background in energy efficiency and played a key role in vast potential studies for utilities in North America. Her typical work entails characterizing measures and working with Dunsky's DEEP model to produce results surrounding technical, economic, and achievable potential. Shruti hold's a bachelor's degree in mechanical engineering, but an interest in a sustainable future led her to complete a master's degree in sustainable energy from the University of Toronto. While there, she gained valuable experience in performing energy audits, finding energy efficiency opportunities, and participating in coding challenges to create smarter cities.

PROFESSIONAL EXPERIENCE

2020 – Present **DUNSKY ENERGY + CLIMATE ADVISORS**
Senior Analyst

Potential Studies

- Characterised 90+ residential efficiency measures for potential studies in Massachusetts, Manitoba, and New Brunswick with a focus on end uses like plug load, heating, cooling, and lighting
- Evaluated and quality checked 130+ commercial efficiency measures for 3 potential studies in Massachusetts with a focus on end uses like plug load, heating, cooling, lighting, and compressed air
- Compiled 1000+ inputs for Dunsky's DEEP model and evaluated the quality of technical, economic, and achievable potential results
- Researched and characterised the technical and economic potential of custom commercial measures like Data Centers across the state of Massachusetts.
- Supported with the maintenance of Excel calculators and the data management of 1000+ inputs needed for potential studies
- Coordinated communication and data sharing between clients, sub contractors and the respective project teams at Dunsky

Energy Efficiency

- Researched and developed 20+ commercial measures from the ground up for NB Power Technical Reference Manual
- Defined baseline efficiencies and calculated annual energy savings from efficient commercial measures by end uses like heavy duty kitchen appliances, water heaters, and refrigerators
- Assisted in creating a graphing tool with 10,000+ inputs for a GHG Intensity Study focused on new construction and existing buildings
- Worked with various stakeholders and drafted the methodology used to define building archetypes for a GHG Intensity Study

Cost-Effectiveness Analysis

- TBD

Other

- Maintained and tracked project planning deliverables ie: MS Planner Tasks, Weekly Status update reports, change order requests, privacy policies and contracts
- Facilitated project planning ie: reviewed deliverables and action items, assign project tasks to members
- Coordinated communication and data sharing between clients, sub contractors and the respective project teams at Dunsky

2019 NOVA CHEMICALS

Data Integrity Administrator

- Spearheaded collection of data to measure KPIs and assessed the data on Excel to make educated decisions on reducing waste in the workflow process
- Identified waste in workflow processes and suggested solutions to reduce delays between tasks; assessed potential savings of $150,000
- Reduced processing hours of daily tasks by over 70% and improved process efficiency by creating templates using VBA

2019 UNIVERSITY OF TORONTO

Teaching Assistant: Infrastructure of Energy and Resources

- Provided a class of 60+ students with guidance and technical assistance on course material covering key trends in the renewable and non-renewable energy technologies
- Created supporting documents for assignments and exams by applying background knowledge of fluid flow, thermodynamics, and heat transfer analyses
- Maintained the online teaching environment and delivered feedback within 48 hours of submission

2018 SHAY'S KITCHEN

Academic project: Energy Auditor

- Performed ASHRAE Level I and II audits on a 2-storeyed commercial kitchen with walk-in coolers, walk-in freezers, convection ovens, etc.
- Assessed the kitchen's architectural layout, HVAC system, lighting systems, and utility bills to estimate the yearly energy consumption and suggest energy saving opportunities
- Performed cost analysis of different energy conservation measures using models such as Net Present Value (NPV), Internal Rate of Return (IRR), and Simple Payback Period (SPP)

2018 BICYCLE THEFT IN TORONTO

Smart-City Challenge: Data Analyst

- Coordinated with team members to statistically analyze bike theft data based on time and location to help allocate resources to theft-prone neighborhoods
- Individually implemented statistical models like Principal Component Analysis (PCA) or DBSCAN in Python using various libraries such as GeoPandas, Scikit-Learn, NumPy, SciPy, etc.
- Visualized data based on time of day and seasons to generate a map of Toronto representing geospatial theft patterns

EDUCATION

MEng., Sustainable Energy	The University of Toronto Toronto, Ontario	2019
B.Sc., Mechanical Engineering	The University of Alberta Edmonton, Alberta	2016

GINETTE RIOPELLE

ASSOCIATE CONSULTANT

Ginette Riopelle is a professional mechanical engineer with over 25 years of experience and a doctor's degree in mechanical engineering from the University of Waterloo. A Certified Measurement and Verification Professional (CMVP) and Certified Energy Manager (CEM), her experience in the energy sector started as a consultant for the mechanical department of a research institute specializing in electricity. She later managed energy efficiency projects—more specifically, energy analyses of commercial and industrial buildings and feasibility studies—for engineering consulting firms. She also acted as a team manager in a technology center specializing in natural gas, where she also served as project manager for on-site and laboratory evaluation activities, and for the development of energy efficiency programs.

PROFESSIONAL EXPERIENCE

2017 – present **PÉRENNE**
Consultant

- Conduct feasibility studies for various energy efficiency projects (eg. ozone laundry systems, hot water space heating systems, steam systems in the agri-food industry):
- Characterize measures (energy savings and costs) for numerous potential studies.

2014 – 2016 **ECONOLER**
Project Manager and Technical Expert

- Managed energy efficiency projects.
- Conducted energy audits.
- Performed site visits and verified energy savings of various projects as part of program evaluation activities.
- Reviewed and adapted energy performance contract clauses.
- Prepared and reviewed measurement and verification plans for energy performance contracts.
- Performed feasibility studies.

2008 – 2014 **NATURAL GAS TECHNOLOGIES CENTRE (NGTC)**
Team Leader

- Managed a team of engineers.
- Reviewed technical aspects of test protocols, service offerings, and calculation and report files.
- Managed consultancy projects in energy efficiency program development for Canadian gas utilities.
- Managed on-site and laboratory projects to validate energy savings generated by various technologies.

2005 – 2008 **DESSAU**

Project Manager in Energy Efficiency

- Assessed efficient technological solutions through feasibility studies for commercial, institutional and industrial buildings, such as hotels, curling venues, greenhouses and health care facilities; participated in the design of HVAC systems using the identified solutions.
- Performed simulations of efficient HVAC and geothermal systems to determine their energy consumption using software programs, such as DOE2.1E, EE4, RETScreen, CONTAM and TRNSYS.
- Reviewed grant applications submitted to Hydro-Québec as part of the Energy Efficiency Program.

1997 – 2005 **MAYA HEAT TRANSFER TECHNOLOGIES LTD**

Senior Software Developer

- Responsible for the fluid dynamics aspect of commercial software ESC (Electronic Systems Cooling):
- Assisted and advised implementation engineers and clients as they encountered difficulties with the simulation of models.
- Ensured the smooth operating of the software and results quality.
- Performed the necessary research and development to incorporate new features into the software.

1994 – 1997 **IREQ (HYDRO-QUEBEC'S RESEARCH INSTITUTE)**

Consultant for the Mechanical Department

- Developed, together with CERCA (centre for research in applied computation), a numerical code for 2D transient fluid computation to predict flow in a turbine wheel.

EXAMPLES OF PROJECTS

- Energy audits of two industrial plants and one warehouse in Quebec (2016);
- Assistance in defining the content of an energy management program for vehicle fleets (2016);
- Verification of the greenhouse gas (GHG) emission reduction from upgrading an unloading system at the Quebec City harbour (2016);
- Feasibility study of various energy production scenarios for a commercial development in Nova-Scotia (2015);
- Site visits and verification of energy savings from various projects as part of the program evaluation activities (2015, 2016);
- Technological watch of energy efficiency HVAC technologies and systems (2009-2014);
- Demand-side-management studies for numerous energy efficient technologies for the account of Canadian gas utilities (2008-2014);
- Stack effect simulations of a Toronto 28-storey condominium building to identify solutions that would minimize the stack effect (2010);
- Feasibility studies of energy efficiency projects for commercial, institutional and industrial buildings, such as hotels, curling venues, greenhouses and health care facilities (2005-2008);
- Simulations of efficient HVAC and geothermal systems to determine their energy consumption (2005-2008);

EDUCATION

Doctorate in Mechanical Engineering	University of Waterloo, Ontario	1992
Master's in Mechanical Engineering	University of Waterloo, Ontario	1987
Bachelor's in Mechanical Engineering	McGill University, Quebec	1985

PROFESSIONNAL ASSOCIATIONS

Member of: Ordre des ingénieurs du Québec (109499), ASHRAE

LANGUAGES

French, English

COMPUTER PROFICIENCY

Fortran, Excel

SCHOLARSHIPS

NSERC Post Graduate Scholarship Award (1987 to 1992)

PUBLICATIONS

G. Riopelle, G.D. Stubley & A.B. Strong (1993). *Numerical Study of the Influence of the Ambient Pressure Field on Free Plane Turbulent Vertical Jets and Plumes*, Numerical Heat Transfer, *Part A: Applications,* Volume 26, no. 3, pp. 272-286.

Riopelle, G. (1992). *Numerical Study of the Influence of the Ambient Pressure Field on Free Plane Turbulent Vertical Jets and Plumes,* Ph.D. Thesis, University of Waterloo.

G. Riopelle, G.D. Stubley (1989). *The Influence of Atmospheric Stability on the "Leipzig" Boundary-Layer Structure*, Boundary-Layer Meteorology, Volume 46, no. 3, pp. 207-227.

G.D. Stubley, G. Riopelle (1988). *The Influence of the Earth's Rotation on Planetary Boundary-Layer Turbulence*, Boundary-Layer Meteorology, Volume 45, no. 4, pp. 307-324.

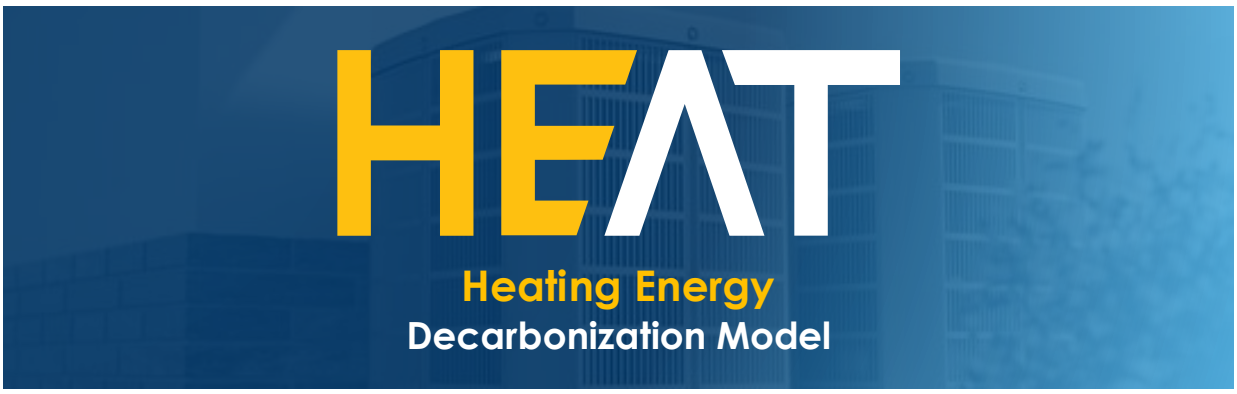
Riopelle, G. (1987). *The Influence of the Earth's Rotation on Planetary Boundary-Layer Turbulence*, Master's Thesis, University of Waterloo.

Appendix B: HEAT and EVA Modeling Value-Add Offers

Should the EERMC be interested, Dunsky can prepare a quote to conduct granular beneficial electrification modeling using Dunsky's industry-leading heat pump adoption (HEAT™) model and/or our EV Adoption Model (EVA). This analysis would help improve the precision of electricity and gas impacts in the state, and would also provide valuable inputs to update the DR potential results.

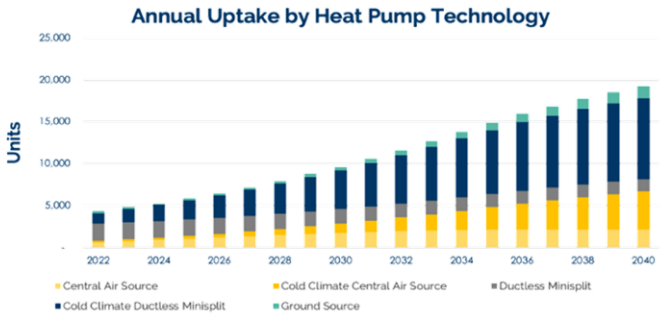
Please see a description of each model below. Should the EERMC be interested, the scope and budget of this additional effort can be discussed during the MPS kick-off.

Dunsky's Heating Energy Decarbonization Model (HEAT™)



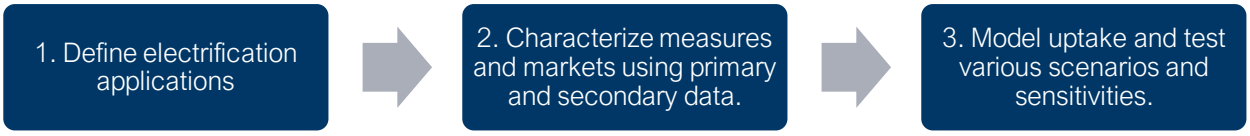
Dunsky's proprietary Heating Energy Decarbonization (HEAT™) model was developed from the ground up to reflect the unique characteristics of cold-climate regions, which present unique challenges. HEAT comes built-in with over 7,000 heat pump permutations (measure/end-use combinations), including all standard and cold-climate heat pump technologies across every technology, market segment and end-use. The model brings a sophisticated approach to assessing how state-of-the-art heat pump technologies perform – and can perform in the future – specifically.

The HEAT™ model was designed to perform the most rigorous assessments of heat pump market potential in a cold-climate region like Canada. It is currently being used to assess the potential for electrification in the U.S. as well, including New York, among the continent's leaders in electrification goals. HEAT™ informs policymakers with accurate assessments of the potential for building heating electrification across the full spectrum of North American climates.



How the model works

Dunsky's proprietary Heating Electrification Adoption Tool (HEAT™) focuses on heat pump adoption to electrify space and water heating demands (including pool heaters). We apply a three-step process to assess the market adoption of electrification measures among customers:



Key features of our approach that ensure an extremely robust analysis include:

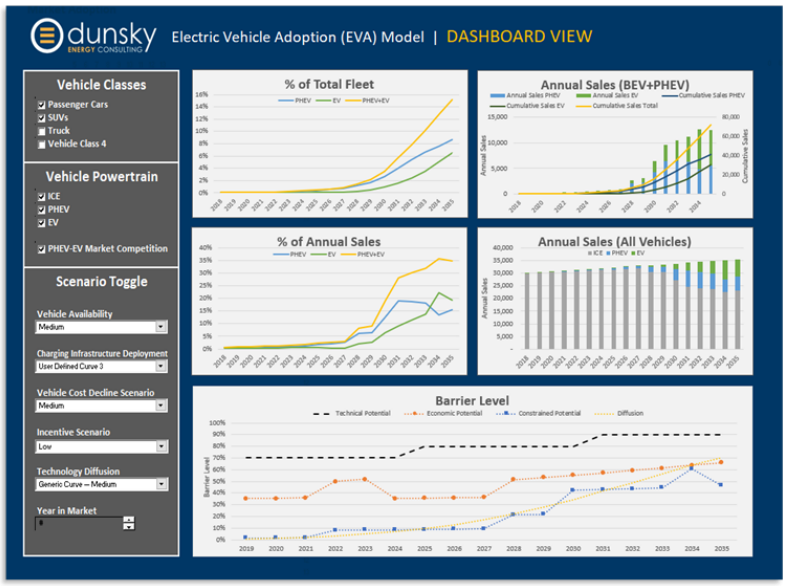
- We apply granular climate-specific HP performance, by accounting for hourly variations in outdoor air temperature (OAT). Our model provides a highly accurate assessment of heat pump energy and demand impacts by estimating heat pump performance as a function of OAT. By using location-specific 8,760 hourly climate data and heat pump performance curves, our model provides a much more precise assessment of heat pump performance than the commonly used HSPF or COP. We gather weather files for a representative market in each jurisdiction.
- We include early replacement schedules, as well as various sizing and control strategies. Our model considers early replacement scenarios from the customer's standpoint – not just scenarios where customers replace existing systems on burnout. We also consider different sizing strategies to ensure all customer use-cases are considered in order to not artificially constrain the possible market. Finally, we account for multiple heat pump control strategies, including systems that run in tandem with other heating systems (e.g. a furnace, boiler, or electric resistance backup system) and systems that switch between heat pump and non-heat pump systems at specific temperature set points. Overall, considering these factors gives a more accurate read on the market size, as well as system costs and performance by determining when and for what duration the heat pumps will operate.
- We capture customer economics precision and evolving trends. Other models typically use the same incremental costs across multiple building segments when, in reality, system costs will vary significantly depending on building type due to different sizing strategies and other cost-impacting variables. Our approach explicitly models these incremental costs as a function of system size to more accurately estimate customer economics on a segment-by-segment basis and provide a better read on customer adoption. We also account for evolution in equipment prices year by year for these emerging technologies. In this way, we develop unique archetypal building level and heat pump unit consumption profiles, considering the monthly heat pump performance, as well as the assumed local baseline technology mix. This then gets

combined with local energy avoided costs in the model itself to give a highly accurate read on heat pump benefits in each jurisdiction and in each market subsector.

Dunsky's Electric Vehicle Adoption (EVA) Model

Dunsky's Electric Vehicle Adoption (EVA) Model was developed in-house to address a growing need by our clients to understand the potential rate of electric vehicle adoption in their respective jurisdictions. Based on rigorous review of research from academia and industry, EVA builds on the knowledge base and expertise from our team's extensive EV practice. EVA assesses the likely penetration of electric vehicle technology based on several key factors, grouped according to the following four categories:

- **Technical potential**: The theoretical potential for deployment based on the size and composition of the overall vehicle market, as well as availability of different powertrain types (e.g. plug-in hybrid, battery electric) in different vehicle classes (e.g. cars, SUVs, trucks, buses, etc.).



- **Customer economics**: The unconstrained economic potential based on incremental Total Cost of Ownership (TCO) of electric vehicles over conventional vehicles, taking into account forecasted energy costs, annual vehicle-miles travelled, and forecasted battery and vehicle costs.

- **Market constraints**: Accounting for EV-specific barriers including range limitations and charging infrastructure capacity, and how these are impacted by future technology improvements.

- **Market dynamics**: Incorporating technology diffusion theory and other market factors to determine rate of adoption and competition between vehicle types.

By quantifying the impact of these various factors, EVA:

1. Provides clients with jurisdiction-specific forecasts for EV adoption

2. Allows them to assess the effectiveness of a range of policy and program options for accelerating EV adoption, such as financial incentives and charging infrastructure deployment, and

3. Assesses the impact of the electrical load growth associated with an increasingly electrified transportation sector, helping utilities to plan ahead for this transition and implement solutions that can help to manage this load growth in the most effective way.

Appendix C: Conflict of Interest Form

Please find here our completed Conflict of Interest form.

Conflict of Interest Form

In order for a proposal to be complete this Conflict of Interest Form must be completely and accurately filled out.

1. Below or via attachment, the Proposer shall identify any relationships between itself or its employees and any Rhode Island electric and/or gas distribution company or its employees that may create a conflict of interest for the proposed scope of work. This includes any program implementation work currently being performed by the Proposer or any program implementation work performed by the Proposer during the past five (5) years related to the electric and/or gas distribution company including work performed in an adversarial proceeding. Also include a description of any relationship with the EERMC that may create a conflict of interest. If there have been no such relationships, a statement to that effect must be made below.

No relationships to disclose.

2. Combined *program implementation* contract amounts from, Pascoag Utility District, Block Island Power Company, National Grid RI, National Grid MA, and PPL cumulative over 2018-2022 for the prime and all subcontractors on the proposed project team	$ 0

By signing below, the Proposer is certifying that all information provided on or attached to this form is accurate

_____ August 4th, 2022

Signature of Authorized Person Date

Alex Hill, Partner

Printed Name, Title