Q&A – Deep Retrofit Challenge (DRC)

Last updated: 09.16.22

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About

The following are responses to the questions received via past webinars (all available on our website) or received via our Better Buildings Partnership e-mail (bbp@toronto.ca). Responses have been edited for clarity and will be updated on a weekly basis.

This is an evergreen document. Some of the questions and answers have been updated to align with the Deep Retrofit Challenge (DRC) information released at time of launch.

1. Are institutional buildings eligible for the Deep Retrofit Challenge?

   No. Institutional-type buildings (i.e. schools, hospitals, etc.) are not eligible to participate in the Deep Retrofit Challenge. Multi-unit residential and commercial office buildings, even if owned by an institution, are eligible to participate.

2. No mention of buildings that currently heat with fuel oil. I assume this is lumped under "fossil fuel heating systems"?

   Yes, fuel oil heated buildings are included under 'fossil fuel' heating systems.

3. Is it possible to have multiple buildings count towards the gross floor area?

   The incentive available under the Deep Retrofit Challenge pertains to one building, not multiple buildings.

4. Has that incentive percentage [for incentive disbursement] for smaller buildings been determined?

   The Incentive Limit for each selected Deep Retrofit Project is:

   $200/m^2 of gross floor area up to a maximum of $500,000 or 25% of Total Project Cost, whichever is less.

5. Can any commercial entity apply (i.e. manufacturing) or is the Challenge limited to City-owned buildings?

   City-owned buildings are not eligible; the Deep Retrofit Challenge is open to privately-owned buildings. To be eligible, a building must be located within Toronto and be an Ontario Building Code Part 3 building (i.e. greater than 600 square meters or greater than three storeys).

   The following building types are eligible to participate in DRC:
   - Multi-unit residential buildings (including condominiums, apartments, etc.)
   - Commercial office buildings.
   - Mixed-use buildings (residential and commercial, including residential over commercial).

6. Are participants allowed to get incentives from other programs as well (i.e. is double-dipping allowed)?

   Participants are allowed to participate in other incentive or grant programs as well as the Deep Retrofit Challenge and stack the incentives, however the City will only cover eligible costs not already funded by other incentives or grants – you cannot double dip to

cover the same expense. Challenge participants must disclose other sources of funding to the City.

For example, if a building receives grant funding for its entire retrofit from another source, the building is not eligible to participate in the Deep Retrofit Challenge.

However, if a building receives an incentive from another source to cover a portion of the retrofit costs and at least 25% of the eligible total retrofit cost is still in need of funding, then the Deep Retrofit Challenge incentive can be used to cover the remaining portion.

If a building receives financing via a City of Toronto program, such as the Energy Retrofit Loan program or High-Rise Retrofit Improvement Support program then this does not count as a grant and the building is still eligible for the maximum incentive available via the Deep Retrofit Challenge.

7. Must the building owner provide 75% of the retrofit costs?

Yes. A building owner selected to participate in the Deep Retrofit Challenge must be able to fund or source funds to pay for the total deep retrofit cost that is not covered by the Deep Retrofit Challenge incentive received. Only 25% of the total eligible deep retrofit cost, up to a maximum of $500,000, depending on building size, may be provided under the Deep Retrofit Challenge.

It is important to note that a portion of the Deep Retrofit Challenge incentive will be held back until a building performance evaluation is conducted one year post-retrofit completion. Therefore, the building owner must be able to carry the cost of the project until the balance of the incentive is paid.

8. Will the City be also doing blower door tests at the applicable points?

Applicants will be required to complete an ASHRAE Level 2 energy assessment as part of their Application submission.

9. Are you actively promoting Passive House techniques and goals?

Participants are welcome to look for guidance via Passive House, including retrofit standards such as EnerPHit, or other low-carbon retrofit standards. These standards are generally aligned with the goals of the Deep Retrofit Challenge.

All projects must meet the minimum requirements set by the Deep Retrofit Challenge however, the City will not be actively promoting use of one standard or approach to completing a deep retrofit project.

10. The distribution of the incentives at different stages of a project such as design/retrofit/post-retrofit performance evaluation - has the percentage of the total incentive available at each stage (based on size of building) been determined?

Please review Sections 4.5 (Claims and Incentive) and 4.6 (Emissions Performance Incentive Limit) of the Applicant Guide available on our website.

11. Are you able to comment more on rent increases? Is there a time duration for the no rent increase requirement (e.g. one year, 10 years, etc.)?

There is no time limit to the requirement. Property owners must agree not to apply for any rent increases above the guideline, as identified in the Residential Tenancies Act, in connection with any portion of improvements funded through the Deep Retrofit Challenge.

12. Is there a conflict between this City program and IESO Save on Energy or can the building owner apply to both?

A participant selected for the Deep Retrofit Challenge is able to also participate in the IESO Save on Energy program. See answer to Question 6 for more details about stacking incentives.

13. Can a company become a partner if the City is still looking for partners for this program?

The City is not actively looking for additional partners in the Deep Retrofit Challenge. However, if you feel that your organization can contribute to the Deep Retrofit Challenge, please email us at bbp@toronto.ca.

14. Can grants from other funding agencies help building owners reach the 20-year payback threshold?

Payback should be calculated based on a lifecycle cost analysis, including at minimum:

- Carbon Pricing; based on Federal schedule of $50/tonne in 2022 escalating by $15/year to $170/tonne in 2030.
- Projected Carbon Pricing of $300/tonne for 2031 and beyond.
- Up to 3% per year escalation of energy costs
- Acceleration of planned capital asset replacements.

Future savings or costs should be discounted using discounted cash flow analysis and your business's discount rate. The discount rate is often based on the business's weighted average cost of capital. If you don't know your discount rate, it's suggested to use a discount rate of 4.5%.

Additionally, the lifecycle cost analysis could include:

- Avoided maintenance costs and other non-energy operating costs
- Risk mitigation, including resilience and adaptation (i.e. longer shelter-in-place times during power outages/extreme weather)
- Occupant benefits (improved comfort, health & wellbeing)
- Repurposed space (i.e. mechanical room no longer needed is converted to occupied space)

- Increased rents (not applicable for residential projects)
- Increased building capital value.

15. Do buildings that have already begun retrofits qualify for the program? For example, older buildings will have undergone ongoing maintenance and upgrades If a multi-unit residential building (MURB) hadn't known about this program and very recently done something, such as roof replacement, then why wouldn't you include that? Perhaps a limit of 12 months back?

    Buildings that have already begun the construction (i.e. demolition, removal of existing equipment or building elements, installation of new equipment or systems, etc.) of the Deep Retrofit Project they are seeking funding for through the Challenge are not eligible to participate in the Deep Retrofit Challenge.

16. Will the cost of an energy audit or carbon neutral studies be an eligible expense and be covered by the funding?

    The cost of an ASHRAE Level 2 energy assessment required for the Application will be at the expense of the Applicant. See full list of eligible costs in Section 4.7 (Eligible Costs) of the Applicant Guide.

17. What is the rationale behind the 20-year payback?

    Natural Resources Canada, the City's funding partner for the Deep Retrofit Challenge, established the 20-year payback requirement as part of their Green Infrastructure Phase II, Energy Efficient Buildings Program. The intent of this requirement is to demonstrate and model affordable deep energy retrofit projects, which is considered to be a 20-year payback period or better.

18. Will energy models be required and if so, with which software? CanQuest, eQuest or another?

    Yes, participants must submit calibrated pre-and post- energy models of the building once the building is accepted into the Deep Retrofit Challenge. There is flexibility in what software Participants can use to conduct their pre-retrofit energy model, however, there is strong preference for selecting a software that can produce a model that can be made public such as EnergyPlus, EQuest, CAN-QUEST, as this will reduce any future barriers or extensive processing once the retrofit is complete and this information is expected to be posted on the City's Open Data portal.

19. For Multi-unit Residential Buildings, does the 50% energy reduction also apply to common area energy consumption? Does the requirement including the energy usage in each individual unit as well?

    The minimum 50% reduction in total energy use intensity and greenhouse gas (GHG) emissions relates to the entire building i.e. energy data aggregated from all utility

accounts (and other energy sources) must be used in energy and emissions reduction calculations to assess whether the building's retrofits have achieved the Deep Retrofit Challenge's energy reduction requirement.

20. Is solar hot water included in this program?

Yes, solar hot water systems are an eligible cost as part of a deep retrofit project under the Deep Retrofit Challenge.

21. Is the 20 year payback requirement calculated before or after the incentive?

The payback calculation should be based on the total project cost (i.e. do not subtract the incentive). The selected projects will be shared publically and should demonstrate replicability and it is more valuable to see a 20 year payback calculation without considering the Challenge incentive. If incorporating the incentive is the only way in which the 20 year payback period requirement can be met, please submit two payback calculations in your application, one without the incentive and one with the incentive.

See response to Question 14 for more details on the payback period.

22. Where will this public data be accessible? Will benchmarking data be available as a result of this Challenge?

One of the key outcomes of the Deep Retrofit Challenge is to publicize all the information from the participating Buildings, as deep retrofit case studies or blueprints, to help drive uptake of similar retrofits in Toronto. The information will likely be made available at the City's Open Data portal website.

Data expected to be released includes, but is not limited to:

- Energy data from Utility Bills
- Energy models
- Design documents
- Budgets
- Realized performance

23. Will the use of geoexchange for heating and cooling rather than electricity be a preferred component in the City’s evaluation of project applications?

The heat source/sink used for a heat pump could be geo/ground exchange, air exchange, ground water or lake water exchange, or waste water recovery, etc. The program does not have a preference for the use of one heat source/sink over another.

The fuel to operate the heat pump which moves heat between any of these source/sinks and the building is most likely electricity, however the program does not restrict this.

The chosen fuel and overall efficiency of the building heating system will contribute to the emissions and energy reductions of the project. The program evaluation criteria scores more points to projects that result in greater emissions and energy reductions.

24. Can this retrofit be only for one building or two?

The Deep Retrofit Challenge will select a total of 10 to 16 buildings to participate. A building owner may submit more than one application to participate in the Deep Retrofit Challenge with each building having its own application.

Where multiple Applications have been received from the same building owner(s), and where the City has determined that more than one of the Applications could be selected to participate in the Deep Retrofit Challenge, the City will offer to fund the Application from among the building owner's Applications receiving the highest score and will consider funding any of the remaining Applications that are acceptable only after the City has first offered to fund all other acceptable Applications submitted by other building owners for other Buildings or Deep Retrofit Projects and only if Deep Retrofit Challenge funding remains available.

25. Having participated in this webinar, are we on the contact list to get notified when the program is open to applications?

Yes, all those who registered for the Introductory Webinar back in May 2022 have been notified about the launch of the Deep Retrofit Challenge. Ongoing updates will also be available on the City's Deep Retrofit Challenge website.

26. How will emergency power be available to large residential buildings after a power outage, as most generators are diesel or natural gas now?

Emergency power strategies may be expanded to include battery storage as well as traditional combustion generation. A fossil fuel generator, used only for emergencies, typically contributes a small percentage to overall building emissions when compared to a fossil fuel heating system – as the low run hours of the generator consume little energy compared to a heating system with high run hours. To fully reach net zero, emergency generators may either use renewable fuels or the remaining emissions may be offset using carbon credits.

27. Is the requirement a 50% reduction from the existing equipment's energy usage?

The 50% minimum energy/emissions reduction requirement under the Deep Retrofit Challenge is based on the building's total energy use intensity and GHG emissions – i.e. the reduction is from a whole building perspective, including the existing equipment’s energy usage.

28. Will there be any targets/requirements for the embodied carbon impact of materials and processes used in the deep retrofit?

Only operational carbon will be used to determine project performance.

However, the program will require calculation of the embodied carbon impact of materials during the design phase (evaluation of this is considered an eligible cost) and

participants are encouraged to choose low embodied carbon materials for their retrofit where possible. There is no requirement to choose low embodied carbon materials. Further details will be provided to selected participants on embodied carbon calculations during the design stage.

29. What is the denominator in "energy intensity"?

When considering energy intensity, we look at the total energy use divided by the floor area of the building. The result will be your total energy per square meter value.

30. Can utility bills substitute for energy modelling?

Once selected, participants will need to provide the City with both utility bills and calibrated pre- and post retrofit energy modelling of their deep retrofit design.

31. Will the Challenge consider a current energy usage from a pre-Covid year, since energy usage during 2020-2022 would not reflect a real scenario for an office building?

You may use 2019 utility data as your baseline if the building's occupancy was affected by COVID-19 (i.e. low occupancy), however, 1) you must provide rationale as to why you are using 2019 utility data as a baseline; and 2) must provide the utility data from 2019 through until current day as part of Attachment 7 of the Application.

32. What is the minimum R^2-Value for the Measurement & Verification and [energy model]?

Measurement and verification will be performed by the City according to International Performance Measurement and Verification Protocol (IPMVP) protocols prior to retrofit commencement and one year post-retrofit.

33. For the specific rules and details which are soon to be released, will the City be consulting stakeholders on these requirements, or will this be based on internal analysis, best practices, etc?

The City consulted internal stakeholders, including building experts and legal advisors, as well as third party Partners of the Deep Retrofit Challenge with the technical details and requirements of the Challenge prior to launch. The City has also referred to best practices of similar existing building energy retrofit programs.

34. Most buildings don't have capacity to do energy use gathering to the standard of the IPMVP. Would we have to install submetering and other equipment monitoring devices? Is there an incentive available for doing so?

If a building is selected to participate in the Deep Retrofit Challenge, the City will coordinate and conduct the Measurement and Verification process as per International Performance Measurement and Verification Protocol (IPMVP). Because energy reductions of at least 50% are required for the Deep Retrofit Challenge, whole building

analysis based on utility bills will typically be sufficient to satisfy the Challenge requirements. As such, we don't expect that the installation of additional metering/monitoring devices will be required.

However, best practices to understand building operation and ensure good ongoing performance would include installation of data collection and monitoring systems, as well as using this data to identify and respond to performance issues. For example, monitoring showing poor performance could trigger equipment repair or recommissioning. These additional metering/monitoring devices would be an eligible cost under the Deep Retrofit Challenge.

35. Would the cost charged by Toronto Hydro to provide more power to the building be eligible for funding through the Challenge?

Electrical service upgrades required to enable a deep retrofit would be an eligible cost under the Deep Retrofit Challenge.

36. How many applications do you anticipate will be submitted for the Challenge?

We do not know how many applications the City will receive.

37. Would a heritage building on a campus qualify for the Deep Retrofit Challenge?

As long as the building meets the eligibility requirements (see question 5) then yes, they may participate. Heritage buildings must still comply with heritage-related regulations and processes.

38. Are student residences at universities and colleges eligible for this program?

See answer to Question 1.

39. Are Ontario Building Code Group F, Division 2 buildings eligible for the Deep Retrofit Challenge?

Group F, Division 2 buildings are industrial-type building and are not eligible to participate in the Deep Retrofit Challenge.

See also Answer to Question 1.

40. The building eligibility statement seems to suggest that 'commercial' means office spaces only. Would a daycare building be considered?

A daycare facility that is categorized as an Ontario Building Code Part 3 Building (i.e. greater than 600 square metres or greater than three storeys) would qualify to participate in the Deep Retrofit Challenge.

41. Are windows without energy star certification considered an eligible measure?

Windows without energy star certification are acceptable given that the windows are certified to similar levels of performance.

42. Are Toronto Community Housing Corporation buildings eligible to apply?

The Deep Retrofit Challenge is open to receiving applications from arms-length City Agencies, Boards and Corporations should the building and project meet our program requirements. See Question 24 about multiple applications from the same building owner.

43. When exactly in Q3 of 2022 will the selection and award process take place? What is the earliest date in 2022 that the design process could start and be eligible as a cost?

Costs related to the design of the Deep Retrofit Project are 'eligible costs'. See Section 5.1 (Application Intake, Review and Selection Timeline) of the Applicant Guide.

44. Is there flexibility on the 12 months of occupancy immediately prior to the renovation?

Additional context for the question: "The project is an owner/occupied building. The client moved their team out of the building to leased premises due to ongoing operational issues with the aging building in late 2019 to allow for a new strategy to be developed and implemented for the project including building upgrades and new workplace interiors. The project has been delayed by the pandemic and the client team has been either working remotely or in a hybrid manner since March of 2020 so the most reliable 12 months of data would be the 12 months prior to relocating to temporary premises since any data over the past 30 months would have to be qualified. No construction has commenced as the project is still in the design stages and deep retrofits to the envelope and mechanical system are currently being contemplated."

Answer: The are several reasons why the eligibility criteria states that the building must have been occupied 12 months prior to retrofit commencement: 1) the City needs reliable and accurate data for the measurement and verification process, and 2) the incentive is not intended for any redevelopment or change of use projects or refurbishment of abandoned buildings. It sounds like your project may be a unique situation and may quality for an exception given that the building has not yet undergone any changes, and you can provide 12 months of utility data pre-vacancy from recent years that could be used.

Based on these circumstances, it may still be worth submitting an application, especially if you intend to take a whole-building systems approach to your deep retrofit.

45. If an applicant is selected to receive the maximum incentive of 25% of their total project cost, are applicants supposed to calculate payback just on the 75% of the project cost?

See Answer to Question 21.

46. Can applicants subtract the dollar amount achieved over the lifecycle in energy savings and greenhouse gas reductions combined from the total project cost to achieve the 20 year payback?

Yes, operational savings should include discounted? savings over the lifecycle, including energy savings and carbon pricing reductions? resulting from greenhouse gas emissions reductions.

Future savings or costs should be discounted using discounted cash flow analysis and your business's discount rate. The discount rate is often based on the business's weighted average cost of capital. If you don't know your discount rate, we suggest you use a discount rate of 4.5%.

See also Answer to Question 14.

47. In reference to Section 6.1.2 of the Applicant Guide and the 'additional' components that can be included in the lifecycle cost analysis, how do applicants quantify these into payback?

How applicants choose to include these components into their payback calculation is at their discretion, as long as all sources and inputs for the calculation are revealed and broken into line items. The following additional tips that may be helpful:

- Discounted? savings from acceleration of planned capital asset replacement can be included (i.e. planned window replacement in 2030 is avoided if replaced as part of retrofit).
- Other costs or savings are project specific and assumptions must be clearly communicated. One example could be avoiding boiler maintenance costs (i.e. burner replacement) while incurring maintenance costs for chiller replaced with a heat pump.
- Check out this report on quantifying the health benefits of retrofits: 'Benefits of Actions to Reduce Greenhouse Gas Emissions in the City of Toronto: Health and Health Equity'.
- Check out this report on quantifying the resilience benefits of retrofits: 'Benefits of Actions to Reduce Greenhouse Gas emissions in Toronto: Climate Resilience'.
- Check out this report on the benefits of improving indoor environmental quality: 'Improving Indoor Environmental Quality in Multi-Unit Residential Buildings'.

48. Is the cost-effectiveness of the project approach measured?

Cost effectiveness is not specifically included in our evaluation criteria, but there are two requirements in regards to project costs that the Deep Retrofit Project must meet: 1) Applicant must demonstrate ability to fund the project; 2) demonstrate a 20 year payback period or better.

49. Can basements be included in total gross floor area?

Basements can be included as part of gross floor area if it utilizes energy for space heating/cooling.

50. Can the minimum 50% reduction requirement for total energy use intensity be substituted by a higher reduction in greenhouse gas emissions? Or can the EUI reduction requirement have exception to process/plug load similar to LEED energy modelling methodology?

There is no exception to the minimum 50% reduction in total energy use intensity required by the Deep Retrofit Challenge. While the requirements may be more easily met by buildings with envelope-dominated thermal loads rather than those with internal/process dominated loads, many buildings with larger internal/process loads can potentially meet the requirement by taking a whole-building analysis approach to their design (e.g. fuel conversion to electric heat pumps, making envelope improvements, incorporating heat recovery from internal process loads, etc.).

51. Is an ASHRAE level 2 energy audit and a feasibility study/detailed engineering design required at the time of application?

Submitting a feasibility study or detailed engineering design is optional, however, completing and submitting an ASHRAE Level 2 energy assessment report (energy audit) is mandatory at time of application.

52. When there is a new addition added to the building in addition to the retrofit, does the target for energy use intensity and emissions reductions include the new space?

The Incentive for the Deep Retrofit Challenge is only intended for the retrofit work related to the existing building structure. The energy and emissions reductions will be based on the difference between energy performance of the existing building and the retrofit area, not including new construction added to the building. However, measurement of the building energy use post-retrofit is required and may require additional metering to separate energy use of the retrofit and new construction areas.

Additionally, any costs related to the addition or expansion of the existing Building and the new space thereafter, will not be eligible for the Deep Retrofit Challenge Incentive.

53. If you plan to install a heat pump, do you have to do more than just that?

More than a single measure must be completed to meet project requirements. The Deep Retrofit Challenge is looking to fund projects that use a comprehensive whole-buildings analysis approach to their Deep Retrofit Project. A more integrated design will score better in the Deep Retrofit Challenge evaluation criteria which can be found in Section 7.3 of the Applicant Guide.

54. Why is payback period important if this is only a demonstration project?

See response to Question 17.

55. Does the retrofit need to start in 2022?

No the retrofit work for Deep Retrofit Projects is not expected to commence by the end of 2022. The design planning process may begin in 2022, but selected Participants will only be given the green light to proceed with their retrofit work once the Participant goes through the City-hosted design charrette process, submits a Deep Retrofit Design Report (more details in Section 5.2 of the Applicant Guide), and receives a Deep Retrofit Design Acceptance Letter from the City. The retrofit work can begin as early as Q1 2023 or depending on the project scope and timeline, it can begin at a later date.

56. Is this program a recurring program we can leverage?

The Deep Retrofit Challenge has been made possible via a grant from Natural Resources Canada to the City of Toronto with a goal to fund 10-16 deep retrofit projects as 'demonstration projects' from now up until 2026 (one year post-retrofit). There are no plans to make the Challenge an ongoing/recurring incentive program.

57. Would two separate applications be required for two separate buildings on the same site but with different addresses?

Yes, each building will require its own Application Form.

See Question 24 about multiple applications from the same building owner.

58. What if supply chain issues further delay project start dates?

The start date for the retrofit is somewhat flexible, however, the critical component is meeting the substantial completion date of January 31, 2025.

59. Are office buildings with dense process and plug loads close to or higher than 50% disqualified or is there an alternative compliance method to meet with 50% energy use intensity reduction?

No, buildings with these type of plug loads are not disqualified.

See Question 50 for more details.

60. Will the design charrette and workshops only be open for participants?

Yes, the design charrette and workshops are customized for the Participant and their Deep Retrofit Project, however, we will be documenting key learnings and sharing more details about the workshop and experience once the Projects begin their retrofit work.

61. At what point is a project considered to have commenced? And at what point can it commence?

In terms of our project requirement that states the Applicant "must not have commenced the retrofit and/or construction phase of their Deep Retrofit Project" we mean making physical changes to the building. The Applicant cannot have already begun to implement the measures proposed in their Deep Retrofit Project for the Deep Retrofit Challenge. Only the design and planning of the Deep Retrofit Challenge can begin prior to application and project selection.

The Deep Retrofit Project can begin once it undergoes a design charrette or workshop led by the City, projected to begin as early as December 2022. The Participant may commence their Project once they submit a Deep Retrofit Design Report (more details in Section 5.2 of the Applicant Guide) and receives a Deep Retrofit Design Acceptance Letter from the City, at which the Participant shall begin the Project within one hundred and twenty (120) calendar days or such other period the City may allow (see Section 5.1 of the Applicant Guide for an illustration of the timeline).

62. Are costs associated to increasing electrical capacity at the tenant panel level eligible?

Costs associated to increasing load capacity are eligible costs. If increasing load capacity at a sub-panel level is necessary to achieve the design requirements for your Deep Retrofit Project, then that could be eligible as well.