ENVIRONICS RESEARCH GROUP

FINAL REPORT

Survey on Building Managers' Knowledge of Indoor Air and Improvement Strategies

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Canadian Committee on Indoor Air Quality and Buildings

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EXECUTIVE SUMMARY

Environics Research Group was retained by the Canadian Committee on Indoor Air Quality and Buildings (CCIAQB) to conduct survey research among building professionals, with the overall objective of establishing a baseline measure of knowledge of indoor air issues and improvement strategies. The survey consisted of 150 interviews conducted by telephone between October 15 and December 3, 2010 with building professionals drawn from a database provided by the International Facility Managers Association (IFMA).

Key findings

The results of the research reveal that building professionals are knowledgeable about indoor air quality issues, particularly about the potential harm to human health. Most provide guidance to and field concerns from tenants about indoor air quality, which likely contributes to their sensitivity to the issue. There is also widespread confidence in the quality of the indoor air in their buildings, although many seem to recognize some room for improvement. Yet there is little sense of urgency for such improvement; most say they have the ability to reduce the concentration of specific pollutants, and few know of design features missing from their buildings that could make a difference.

The following summarizes the key findings of the research:

GENERAL KNOWLEDGE

- Relatively few building professionals are aware of the best overall way to improve indoor air quality. Three in ten correctly identify "pollutant source control" as most effective; by comparison, almost half think the best method is "increasing ventilation" and another quarter think it is "air cleaning".

- Changing air filters is by far the best-recognized maintenance technique for improving a building's air quality. When prompted, a majority of building professionals also consider increasing ventilation to be highly effective, while duct cleaning, cleaning with low-emission products, and using a humidifier or a dehumidifier are rated as moderately so.

- Most building professionals say that mold and bacteria, second-hand tobacco smoke, and formaldehyde are very harmful to human health. There is less certainty regarding the potential

harm from volatile organic compounds (VOCs), dust and cosmetic scents, although few say they are not harmful.

BUILDING STATUS

- Almost all building professionals feel that the air quality in their building over a typical year is good. However, only one in three rate it as very good (the highest possible rating), suggesting that many recognize room for improvement. Only a very small minority (5% total) rate the indoor air quality below good (i.e., poor or neither good nor poor).

- Most building professionals say that their tenants report health issues related to indoor air quality, the most common being headaches, allergic reactions and dry eyes. Dust or particles, cosmetic scents and odours, and VOCs are thought to have the greatest impact on health in their buildings.

- Building professionals are able to reduce the concentration of most pollutants in their buildings. This ability is most widespread for dust and particles, but majorities also say they can reduce the concentrations of VOCs, bacteria and mold, cosmetic scents and odours, second-hand tobacco smoke and formaldehyde.

- The design features most commonly incorporated into buildings to address indoor air quality are air filters and air quality or carbon dioxide (CO_2) monitoring systems. Only a minority (24%) of building professionals could identify any such features that are missing from their building, which in most cases is due to the expense involved, specific design issues or the age of the building.

SPECIFIC DEVICES OR PROCEDURES USED TO IMPROVE AIR QUALITY

- The use of specific indoor air quality devices or maintenance procedures varies considerably. Central HVAC air filtration systems are almost universal. In contrast, most building professionals are aware of portable air cleaners and heat recovery ventilators, but only minorities report using them in their buildings (8% and 24%, respectively). Half of building professionals report that the air ducts in their building have been cleaned.

- Effectiveness and cost tend to be the main factors considered in selecting a particular product, model or company. Reputation is also important in the selection of an air duct cleaning company.

- About half of building professionals responsible for buildings with HVAC air filtration or that have had air ducts cleaned have seen evidence of a positive impact on indoor air quality from these approaches. (There is also a moderate sense of impact in the case of portable air cleaners and heat recovery ventilators, although the sample size of users is too small to allow for quantitative conclusions). Specific measurements of change in indoor air quality have been taken in about three in ten cases where these methods have been introduced; where such measurement has been done, it is most likely to consist of air quality testing.

IAQ INFORMATION

- Most building professionals say they provide guidance on indoor air quality to the occupants and organizations in their buildings. When they need more information on indoor air quality, they are most likely to turn to air quality consultants, and building or air quality organizations.

Recommendations

Based on the findings of this research, the following recommendations for further work are presented to CCIABQ for consideration:

1. The current research provides a valid and reliable set of benchmark data for comparing against future surveys. It would be worthwhile to repeat this research again in a few years' time to determine if building professionals' knowledge of indoor air quality issues has changed, and to assess the effectiveness of any education or communications initiatives that CCIABQ may undertake in the meantime.

2. CCIABQ may wish to consider complementing the information in this survey with qualitative (focus group) research, designed to explore how building professionals think about indoor air quality and the barriers to action, and to test strategies and/or information that would resonate most strongly.

RÉSUMÉ DU RAPPORT

Les services d'Environics Research Group ont été retenus par le Comité canadien sur la qualité de l'air intérieur et les bâtiments (CCQAIB) pour mener une enquête auprès de professionnels de la gestion d'immeubles. L'objectif principal de cette recherche était d'établir une mesure de base de la connaissance chez ces professionnels des enjeux liés à la qualité de l'air intérieur et aux stratégies d'amélioration. Cette enquête a été menée par le biais d'entrevues téléphoniques effectuées entre le 15 octobre et le 3 décembre 2010 auprès de professionnels de la gestion d'immeubles recrutés à partir d'une base de données fournie par l'Association internationale de la gestion d'établissements (*International Facility Managers Association (IFMA)*).

Conclusions principales

Les résultats de la recherche révèlent que les professionnels de la gestion d'immeubles connaissent les enjeux liés à la qualité de l'air intérieur, particulièrement en ce qui a trait aux dangers potentiels pour la santé humaine. La plupart d'entre eux fournissent des conseils à leurs locataires et répondent aux préoccupations de ces derniers en ce qui concerne la qualité de l'air intérieur, ce qui contribue probablement à leur ouverture envers cet enjeu. Les professionnels de la gestion d'immeubles se montrent également largement satisfaits de la qualité de l'air à l'intérieur de leurs édifices, même si plusieurs reconnaissent que des améliorations peuvent toujours être apportées sur ce plan. Peu d'entre eux sont toutefois pressés d'apporter de telles améliorations. La plupart des répondants affirment être en mesure de réduire la concentration de certains polluants spécifiques, mais un petit nombre seulement semble au courant des caractéristiques techniques (qui ne se retrouvent pour le moment pas dans leurs immeubles) susceptibles faire une différence dans ce domaine.

Voici un résumé des principales conclusions de la recherche :

CONNAISSANCE GÉNÉRALE

- Relativement peu de professionnels de la gestion d'immeubles savent quelle est la meilleure méthode pour améliorer de façon globale la qualité de l'air intérieur. Trois répondants sur dix identifient correctement le « contrôle des sources de polluants » comme étant la méthode la plus efficace; près de la moitié des professionnels croient plutôt que la meilleure méthode consiste à « augmenter la ventilation », alors qu'un autre quart des répondants pensent plutôt qu'il faut « épurer l'air ».

- Le changement des filtres à air s'avère, de loin, la technique d'entretien la plus connue lorsqu'il est question d'améliorer la qualité de l'air d'un immeuble. Lorsqu'invités à réfléchir aux bénéfices d'une augmentation de la ventilation, les professionnels de la gestion d'immeubles jugent majoritairement cette mesure très efficace, alors que le nettoyage des conduits, le nettoyage avec des produits ayant un faible taux d'émissions et l'utilisation d'un humidificateur ou d'un déshumidificateur sont jugés modérément efficaces.

- La plupart des professionnels de la gestion d'immeubles affirment que la moisissure et les bactéries, la fumée secondaire provenant du tabac et le formaldéhyde sont très néfastes pour la santé. Les répondants se montrent moins affirmatifs lorsqu'il est question de la dangerosité potentielle des composés organiques volatils (COV), de la poussière et des désodorisants d'intérieur, bien que peu d'entre eux disent qu'ils ne sont pas néfastes.

ÉTAT DE L'IMMEUBLE

- Presque tous les professionnels de la gestion d'immeubles estiment que la qualité de l'air à l'intérieur de leurs immeubles au cours d'une année normale est bonne. Seulement un répondant sur trois la juge cependant très bonne (la meilleure évaluation possible), ce qui suggère que plusieurs d'entre eux reconnaissent qu'il est tout de même possible de faire mieux. Seule une très petite minorité de répondants (5 % au total) jugent que la qualité de l'air à l'intérieur de leurs immeubles est inférieure à « bonne » (c.-à-d., mauvaise ou ni bonne ni mauvaise).

- La plupart des professionnels de la gestion d'immeubles affirment que leurs locataires leur signalent leurs problèmes de santé liés à la qualité de l'air intérieur. Parmi ces problèmes de santé, les plus couramment rapportés sont les maux de tête, les réactions allergiques et les yeux secs. La poussière et les particules, les désodorisants d'intérieur et les COV sont jugés comme étant les éléments ayant le plus d'impact sur la santé des locataires de leurs immeubles.

- Les professionnels de la gestion d'immeubles sont en mesure de réduire les concentrations de la plupart des polluants à l'intérieur de leurs immeubles. Cette capacité est généralisée dans le cas de la poussière et des particules, mais une majorité de répondants affirment être également en mesure de diminuer les concentrations de COV, de bactéries et de moisissures, de désodorisants d'intérieur, de fumée secondaire provenant du tabac et de formaldéhyde.

- Les dispositifs destinés à améliorer la qualité de l'air à l'intérieur des immeubles les plus souvent installés dans les édifices sont les filtres à air et les systèmes de surveillance de la qualité de l'air

ou du dioxyde de carbone (CO_2). Seule une minorité de professionnels de la gestion d'immeubles (24 %) sont en mesure d'identifier des dispositifs d'amélioration de la qualité de l'air absents de leurs immeubles. Cette absence de certains dispositifs s'explique d'abord par les dépenses qu'entraîne l'installation de ces systèmes, par certaines questions de conception ou par l'âge des immeubles concernés.

DISPOSITIFS OU MÉTHODES SPÉCIFIQUES UTILISÉS POUR AMÉLIORER LA QUALITÉ DE L'AIR

- L'utilisation de dispositifs ou de méthodes spécifiques d'amélioration de la qualité de l'air varie considérablement parmi les professionnels de la gestion d'immeubles. Les systèmes de filtration d'air CVCA sont utilisés par presque tous les répondants. À l'inverse, si la plupart des professionnels de la gestion d'immeubles connaissent l'existence des assainisseurs d'air portatifs et des ventilateurs-récupérateurs de chaleur, seule une minorité d'entre eux rapportent les utiliser à l'intérieur de leurs immeubles (8 % et 24 %, respectivement). La moitié des professionnels de la gestion d'immeubles signalent que les conduits d'air à l'intérieur de leurs immeubles ont été nettoyés.

- L'efficacité et le coût constituent pour la majorité des répondants les facteurs principaux influençant leur choix d'une compagnie, d'un modèle ou d'un produit précis destiné au nettoyage des conduits d'air; la réputation d'une compagnie donnée joue également un rôle important.

- Environ la moitié des répondants responsables d'immeubles dotés de systèmes de filtration d'air CVCA ou dont les conduits d'air ont été nettoyés signalent que ces mesures prises ont eu un impact positif sur la qualité de l'air intérieur. (Un sentiment d'impact modéré a également été noté parmi les répondants en ce qui a trait aux assainisseurs d'air portatifs et aux ventilateurs-récupérateurs de chaleur, bien que la faible taille de l'échantillon des utilisateurs de ces dispositifs ne permette pas de tirer des conclusions quantitatives dans ce cas.) Des mesures précises des changements apportés à la qualité de l'air intérieur ont été effectuées par environ trois répondants ayant utilisé les méthodes citées plus haut sur dix. Ces mesures, lorsqu'effectuées, ont majoritairement consisté en des tests et mesures de la qualité de l'air.

INFORMATIONS AU SUJET DE LA QUALITÉ DE L'AIR INTÉRIEUR

- La plupart des professionnels de la gestion d'immeubles affirment fournir des conseils aux occupants et aux organismes de leurs immeubles en ce qui a trait à la qualité de l'air intérieur. Lorsqu'ils désirent obtenir davantage de renseignements au sujet de la qualité de l'air intérieur, les répondants consultent principalement des conseillers en matière de qualité de l'air et des organismes spécialisés en gestion d'immeubles ou en qualité de l'air.

Recommandations

En réponse aux conclusions de cette recherche et en vue de travaux futurs, les recommandations suivantes sont présentées au CCQAIB pour étude :

1. La présente recherche fournit une série de données de référence valides et fiables, permettant une comparaison avec des sondages futurs. Il serait utile de répéter cette enquête dans quelques années afin de déterminer la mesure dans laquelle la connaissance affichée par les professionnels de la gestion d'immeubles a évolué et d'évaluer l'efficacité des mesures d'éducation et de communication potentiellement adoptées par le CCQAIB entre-temps.

2. Le CCQAIB pourrait souhaiter ajouter aux informations obtenues par le biais de ce sondage en menant une recherche qualitative (groupe de discussion) ayant pour but d'explorer la façon dont les professionnels de la gestion d'immeubles perçoivent la qualité de l'air intérieur et les obstacles à la prise de mesures concrètes. Une telle recherche pourrait également permettre d'évaluer les stratégies ou les informations les plus susceptibles de trouver un écho auprès des personnes concernées.

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INTRODUCTION

Poor indoor air quality is a public health issue in Canada. Canadians typically spend close to 90 percent of their time indoors, and therefore have greater exposure to indoor pollution than to outdoor air pollution. Indoor air pollution has been shown to cause and/or exacerbate a wide array of health effects, including allergies, asthma, lung cancer, respiratory infections (e.g., bronchitis and pneumonia), ear, nose and throat irritation, and heart disease. These health effects have large associated economic impacts in the form of costs to the health care system, lost worker productivity and lower quality of life for individuals who experience these health effects.

The Canadian Committee on Indoor Air Quality and Buildings (CCIAQB) was established in 2008, with the goal of being the national focal point for information about the design and operations of buildings as they affect indoor air quality. While there exists a body of public opinion research about indoor air quality where people live, CCIAQB had identified an information gap related to public awareness and knowledge regarding indoor air quality in the workplace.

Lack of understanding can be a significant barrier to behavioural change and to the implementation of solutions/technologies (e.g., improved ventilation) that can enhance indoor air quality and ultimately, the health of building occupants. The CCIAQB has identified a need for primary research to bridge this information gap.

In response to this need, Environics Research Group was retained by the CCIAQB to conduct survey research among building professionals, including building managers, property managers and facility managers. The overall objective of the survey is to establish a baseline measure of knowledge of indoor air issues and improvement strategies among these professionals.

The survey consists of 150 interviews conducted by telephone between October 15 and December 3, 2010 with building professionals drawn from a database provided by the International Facility Managers Association (IFMA). The margin of error for a probability sample of this size is plus or minus 8.0 percentage points, 19 times in 20. A more detailed description of the methodology used to conduct this study is provided at the back of this report, along with a copy of the questionnaire (see Appendix).

Provided under separate cover is a set of detailed "banner tables" that present the results for all questions by population segments as defined by relevant building characteristics. *All results are expressed as a percentage, unless otherwise noted.*

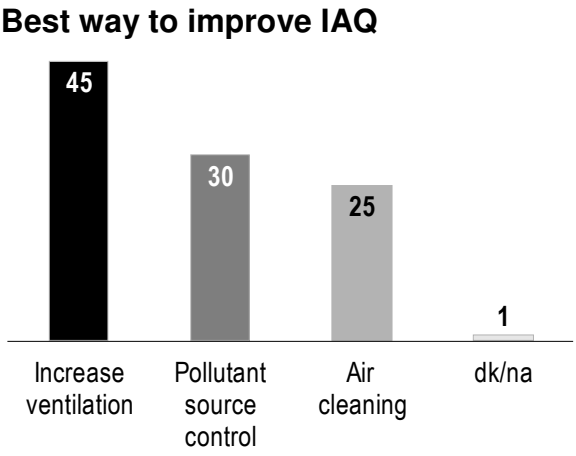
GENERAL IAQ KNOWLEDGE

The initial survey questions addressed building professionals' general knowledge, in terms of how best to improve indoor air quality, and the extent to which indoor air pollutants impact human health.

Best way to improve IAQ

A plurality of building professionals say that the best way to improve indoor air quality is increasing ventilation.

Building professionals were asked which of three approaches – increased ventilation, pollutant source control or air cleaning – is the best way to improve indoor air quality in buildings.[1] Three in ten (30%) are aware that pollutant source control is most effective. However, the largest proportion believe increased ventilation (45%) is the best method, and one in four (25%) believe it is air cleaning. *(Q.2)*



Building professionals whose buildings are not green-rated are more inclined to select pollutant source control. Air cleaning is more likely to be selected by building professionals outside of Ontario.

[1] Survey respondents were read an explanation of these terms only if they asked for one. Without a clear definition, it is possible that some respondents did not share the same understanding of the terms as was intended in the survey.

Maintenance techniques for improving IAQ

Building professionals view changing air filters as the most effective maintenance procedure for improving indoor air quality, while increasing ventilation rates is also considered a very effective technique.

Top-of-mind awareness. Building professionals were asked (unprompted, without providing response categories) about the *maintenance techniques or procedures* through which a building's air quality can be improved (separate from any design features and equipment).

Changing air filters (79%) is by far the most commonly identified maintenance technique for improving indoor air quality. A number of other procedures are mentioned by smaller proportions of building professionals, including increasing ventilation rates (29%), duct cleaning (23%), inspections and monitoring (14%), general or preventative maintenance programs (13%), and cleaning with low emission products (7%). *(Q.3)*

Top-of-mind awareness of maintenance techniques that improve indoor air quality

	%
Changing the air filter(s)	79
Increasing ventilation rates/fresh/outdoor air intake	29
Duct cleaning	23
Inspections/monitoring	14
General maintenance/preventative program	13
Cleaning with low emission products	7
Humidification	3
Cleaning with standard products	2
Dehumidification	1
Other	4
dk/na	5

Professionals responsible for buildings with only one tenant are more likely to mention inspections and monitoring. Building professionals in Ontario are more likely to mention general or preventative maintenance programs; those outside Ontario are more inclined to mention changing air filters.

Effectiveness. Building professionals were asked to rate the effectiveness of a number of maintenance procedures in improving air quality in buildings. Almost all (91%) rated changing air

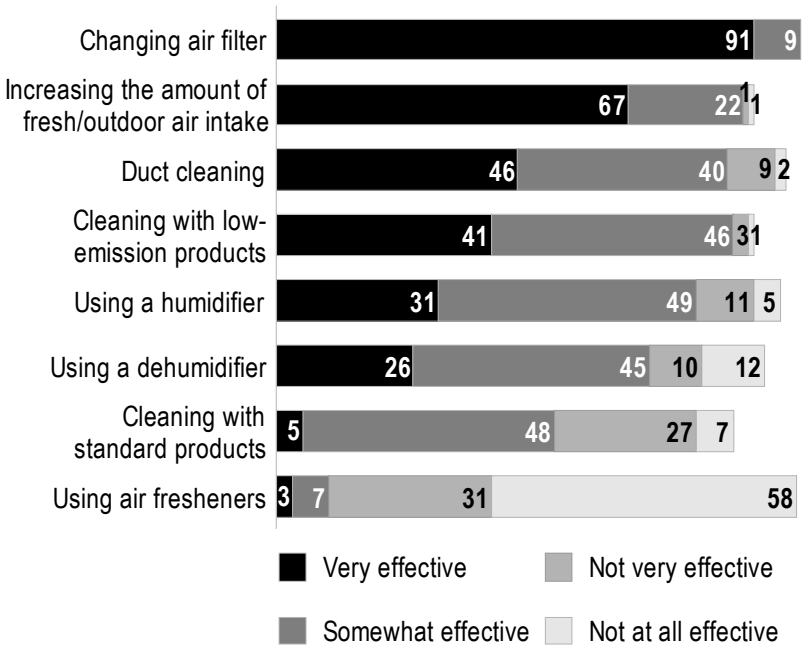
filters as a very effective technique. A majority (67%) also consider increasing ventilation rates or the amount of fresh air or outdoor air intake to be a very effective method. (*Q.4)*

Fewer than half of building professionals gave the same high rating of effectiveness to duct cleaning (46% very effective), cleaning with low emission products (41%), using a humidifier (31%), and using a dehumidifier (26%). In each of these cases, most of the remainder consider these to be somewhat effective techniques.

There are mixed views about the impact of cleaning with standard products. Very few (5%) rate it to be a very effective way of improving improve indoor air quality, with most saying it is either somewhat (48%) or not very (27%) effective.

Most building professionals are aware of the ineffectiveness of using air fresheners. Nine in ten say this method is not very (31%) or at all (58%) effective in improving indoor air quality.

Effectiveness of maintenance techniques



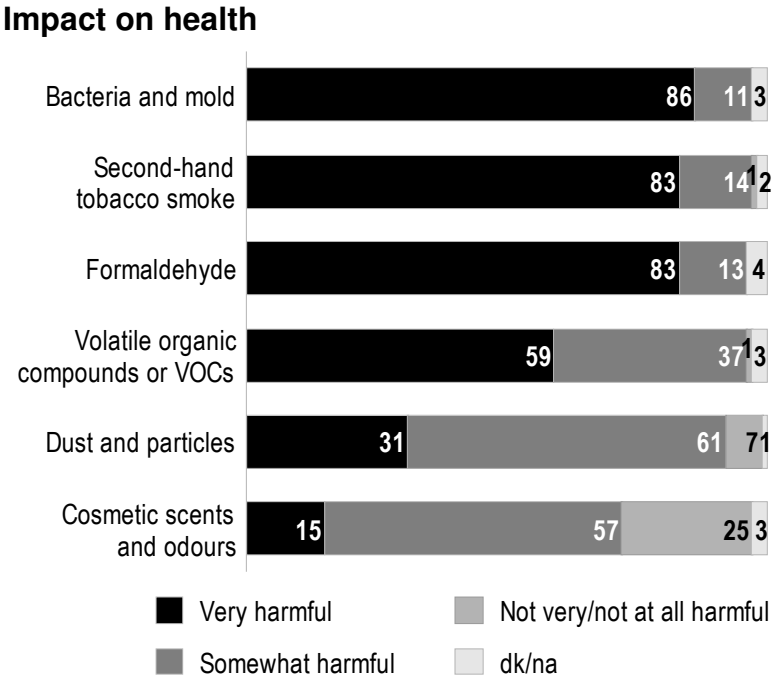
Building professionals responsible for newer buildings (post 1980), smaller buildings (up to 175,000 sq. ft.) and buildings with fewer people (up to 1,000) are more likely to rate cleaning with a low emission product as very effective. Building professionals in Ontario are more likely to view duct cleaning as very effective.

Impact on health

Most building professionals consider mold and bacteria, second-hand tobacco smoke and formaldehyde to be very harmful to human health.

How aware are building professionals of the impact of indoor air pollutants on human health? Large majorities say that bacteria and mold (86%), second-hand tobacco smoke (83%) and formaldehyde (83%) are very harmful to health. There is also moderate awareness of the harm that can be caused by volatile organic compounds or VOCs (59% very harmful to health).

By comparison, few building professionals say that dust and particles (31%), or cosmetic scents and odours (15%) are very harmful to health. In both cases, most of the remainder say these pollutants are somewhat harmful; only minorities believe they are not harmful (7% in the case of dust; 25% in the case of cosmetic scents). *(Q.5)*



Bacteria and mold is considered more harmful by building professionals responsible for larger (more than 175,000 sq. ft.) buildings, while second-hand tobacco smoke and dust/particles are seen as more harmful by those responsible for smaller buildings. Those responsible for buildings with fewer people (up to 1,000) are also more likely to say second-hand tobacco smoke is very harmful.

BUILDING STATUS

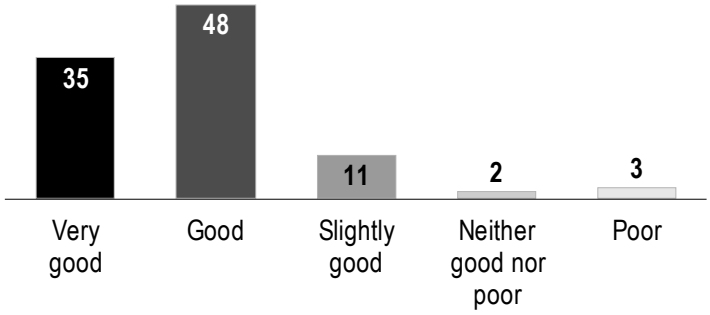
Building professionals were asked about the status of their own building, in terms of the indoor air quality, the extent to which tenants report health complaints due to indoor air quality, their ability to reduce indoor air pollutants, and the design features that are incorporated into the building to improve indoor air quality.

Impressions of IAQ

Almost all building professionals feel that the air quality in their building is good. Facility managers are most frequently identified as the individual responsible for the indoor air quality.

The impression of almost all building professionals concerning the indoor air quality in their building over a typical year is that it is good. One in three (35%) rate their building's indoor air quality as very good, while half (48%) describe it as good and 11 percent say it is slightly good. By comparison, very few say the air quality is poor (3%). Two percent describe the air quality as neither good nor poor. *(Q.1)*

Rating of building's IAQ



The most commonly identified person with responsibility for ensuring good indoor air quality in the building is a facility manager (63%). Other professionals or individuals who are mentioned as being responsible include property managers (18%), building owners or landlords (17%), operations departments (12%), building operators (10%), occupational health and safety personnel (9%), building supervisors (6%) and the occupants (6%). *(Q.40)*

Reporting of health issues related to IAQ

Most building professionals say that their tenants report health issues related to indoor air quality, particularly headaches, allergic reactions and dry eyes. Dust, cosmetic scents and VOCs are thought to have the greatest impact on health in their buildings.

According to building professionals, it is common for tenants to report health issues related to indoor air quality. Almost nine in ten (86%) say that the tenants in their buildings report such issues. Building professionals who work in green-rated buildings are more likely to say they receive reports of health issues (97%). *(Q.6)*

Among building professionals who receive reports of health issues, a wide variety of issues are brought to their attention. The most commonly reported health issues (unprompted, without providing response categories) are headaches (29%), allergic reactions (25%) and dry eyes (21%). Other issues reported by tenants include stuffy nose (16%), nausea (11%), colds and flus (9%), asthma (9%), fatigue (8%), skin irritation (7%) and coughs (6%). Very small proportions (2% or fewer each) mention such issues as difficulty breathing, dizziness and inability to concentrate, sore or dry throat, and blurred vision. One-quarter could not be specific about the types of health problems that get reported. *(Q.7)*

Health issues reported

	%
Headaches	29
Allergic reactions	25
Dry eyes	21
Stuffy nose	16
Nausea	11
Colds and flu	9
Asthma	9
Fatigue	8
Skin irritation/rashes	7
Cough	6
Breathing difficulties	2
Dizzy/can't concentrate	2
Sore/dry throat	2
Sore/blurred vision	2
Other	4
dk/na	24

Subsample: Among those who say tenants report their health issues related to indoor air quality (n=129)

Those responsible for buildings with two or more tenants are more likely to mention reports of nausea. Those responsible for larger buildings (more than 175,000 sq.ft.) and buildings with more people (more then 1,000) are more likely to mention reports of fatigue; building professionals in Ontario are also more likely to mention reports of fatigue.

Reported source of pollution. Building professionals identify a variety of sources having the greatest impact on health or complaints about health in their buildings (unprompted, without providing response categories). The most common are dust or particles (26%), cosmetic scents and odours (25%), and volatile organic compounds or VOCs (20%). Other sources mentioned include bacteria or mold (10%), temperature (i.e., too hot or too cold – 6%), air circulation problems (5%), second-hand tobacco smoke (2%) and formaldehyde (1%). *(Q.8)*

Sources of indoor air pollution thought to have greatest impact on health in their building

	%
Dust/particles	26
Cosmetic scents and odours	25
Volatile organic compounds (VOCs)	20
Bacteria or mold	10
Temperature/too hot/too cold	6
Air circulation/flow	5
Second-hand tobacco smoke	2
Formaldehyde	1
Other	6
dk/na	17

Those responsible for buildings with fewer people (up to 1,000) are more likely to cite cosmetic scents as having the greatest impact. Those with green-rated buildings are more likely to mention VOCs. Those responsible for older buildings (pre-1981) are more likely to mention temperature issues.

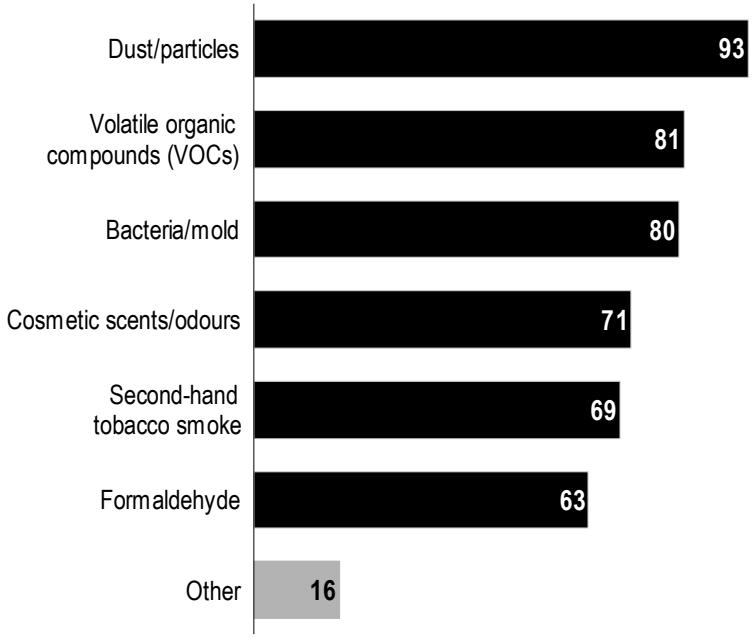
Reducing concentration of pollutants

Building professionals are most able to reduce the concentrations of dust and particles, VOCs, and bacteria and mold.

Most building professionals say they can reduce the concentrations of pollutants in their buildings, although this varies moderately by the type of pollutant. Just over nine in ten (93%) building professionals say they can reduce the concentrations of dust and particles (93%), while eight in ten say the same of VOCs (81%), and bacteria and mold (80%). Seven in ten can reduce the concentrations of cosmetic scents and odours (71%), and second-hand tobacco smoke (69%), while just over six in ten can do so with formaldehyde (63%). *(Q.9)*

Building professionals responsible for older buildings (pre-1981) are more likely to say they can reduce concentrations of bacteria and mold.

Able to reduce concentrations of pollutants in building



Design features to address IAQ

The design features most frequently used to address poor indoor air quality are air filters, and air quality or carbon dioxide (CO_2) monitoring systems. One in four building professionals identify a design feature that is missing from their building, most commonly because it is too expensive.

Incorporated features. Building professionals identify a number of features or indoor air quality devices that are incorporated into their buildings to address indoor air quality (unprompted, without providing response categories). The most frequently mentioned features are air filters (38%), and air quality or CO_2 sensors (33%). Other design features include humidifiers (11%), HVAC air filtration (10%), dehumidifiers (7%) and the location of air intake (5%). Very small proportions (2% or fewer each) mention having HVAC cycling/scheduling, HEPA filters, heat-recovery ventilators, air fresheners and entrance mats. *(Q.10)*

One-quarter say there are no design features to address indoor air quality in their building (19%) or do not know (6%).

Design features incorporated into building to address indoor air quality

	%
Air filtration/filters (unspecified)	38
Air quality or CO_2 sensors/monitoring system	33
Humidifier/humidification	11
HVAC air filtration	10
Dehumidifier/dehumidification	7
Location of air intake	5
HVAC cycling/scheduling	2
HEPA filters	2
Other	6
None	19
dk/na	6

Those responsible for large buildings (more than 175,000 sq ft), buildings with one tenant and green-rated buildings are more likely to mention having air quality or CO_2 sensors.

Missing features. Building professionals were also asked (unprompted, without providing response categories) whether, to the best of their knowledge, there are design features or devices to address indoor air quality that are *missing* from their buildings. Only about one-quarter could identify at least

one missing design feature. These include air quality or CO_2 sensors (9%), humidifiers or humidification (5%), air filtration/filters (4%) and HEPA filters (3%). The majority (63%) of building professionals say there are no missing features, and a further 13 percent do not know one way or the other. *(Q.11)*

Design features to address indoor air quality missing from building

	%
Air quality or CO_2 sensors/monitoring system	9
Humidifier/humidification	5
Air filtration/filters (unspecified)	4
HEPA filters	3
Dehumidifier/dehumidification	1
Heat-recovery ventilator	1
Location of air intake	1
HVAC air filtration	1
Other	3
No, none	63
dk/na	13

Building professionals who identify missing features (25% of the total sample) were asked the reasons why their building does not have such features (unprompted, without providing response categories). The most common reason is that it is too expensive to purchase, install or maintain (51%). Other reasons why design features are missing include design issues (38%), building age (30%), the view that it is not the responsibility of the building operator (5%), presence of short-term tenants (3%) and the perception that it is too difficult to maintain (3%). *(Q.12)*

Reasons building does not have design features to address indoor air quality

	%
Too expensive	51
Design issue	38
Building age	30
Not responsibility of building operator	5
Short-term tenant	3
Too difficult to maintain	3
Other	5
dk/na	5

Subsample: Among those who identify design features missing from their building (n=37)

CENTRAL HVAC AIR FILTRATION SYSTEMS

Nine in ten (92%) building professionals report that their building has central HVAC air filtration. This group was asked about how they selected the system, the maintenance schedule and the impact the HVAC air filtration system has had on indoor air quality. *(Q.13)*

Selection

The most common reason for selecting a particular model of HVAC air filtration system is its effectiveness.

Professionals responsible for buildings with a central HVAC air filtration system were asked (unprompted, without providing response categories) what factors influenced their decision to choose a particular model (if they were involved in the selection process). The largest proportion say their choice was based upon the effectiveness of the model (46%). Other factors include cost (22%), energy efficiency (15%), ease of maintenance (12%), reputation (7%), ease of use (7%), customer service (7%), and suitability for the job (6%). One-third (35%) say they were not involved in the decision and four percent say the current unit has always been part of the building. *(Q.14)*

Reasons for choosing particular model of HVAC air filtration system

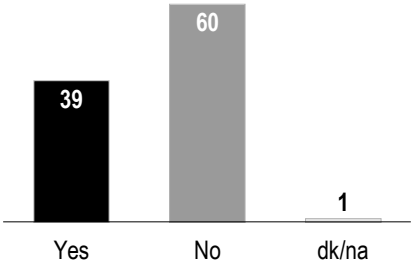
	%
Effectiveness	46
Cost	22
Energy efficiency	15
East of maintenance	12
Reputation	7
Ease of use	7
Customer service	7
Suitability for job	6
Compatibility with other systems	3
Based on industry rating scheme	3
Was recommended	2
Other	2
Has always been part of the building	4
Was not involved in decision	35
dk/na	1

Subsample: Among those with HVAC air filtration systems (n=138)

Those responsible for buildings with only one tenant are more likely than those with more tenants to cite effectiveness as the reason for their choice of HVAC system.

Four in ten (39%) building professionals responsible for buildings that have HVAC filtration systems say that they have heard of HVAC filtration rating schemes. *(Q.15)*

Awareness of HVAC air filtration rating schemes



Subsample: Among those with HVAC air filtration systems (n=138)

Maintenance

The most common maintenance schedules for HVAC air filtration systems are every month or every three months.

Among building professionals with a HVAC air filtration system in their building, the most common maintenance schedules reported are every month (30%) or every three months (38%). Other schedules are much less common. Thirteen percent do not know how often the HVAC system is maintained. *(Q.16)*

HVAC air filtration system maintenance schedule

	%
Weekly	4
Biweekly	1
Monthly	30
Every other month	4
Every three months	38
Every six months	7
Every year	1
dk/na	13

Subsample: Among those with HVAC air filtration systems (n=138)

Those responsible for green-rated buildings are more likely to report more frequent maintenance (weekly or bi-weekly) of their HVAC system.

Impact

More than half of building professionals have seen evidence of a positive impact of HVAC filtration on indoor air quality, particularly fewer occupant complaints. Only three in ten report that specific measurements have been taken, most commonly air quality testing.

Among building professionals responsible for buildings with an HVAC air filtration system that were not originally part of the building, more than half (54%) have seen evidence that the HVAC system has positively affected the air quality in the building. This includes fewer occupant complaints (25%), results of air quality testing (14%), better indoor air quality (14%), fresher air (6%), no decrease in air quality (6%) and fewer occupant health problems (3%). Four in ten (40%) have seen no evidence of improvement in indoor air quality, while six percent cannot say. *(Q.17)*

Evidence of HVAC air filtration system impact on indoor air quality

	%
Fewer occupant complaints	25
Results of air quality testing	14
Better indoor air quality	14
Fresher air	6
No decrease in air quality	6
Fewer occupant health problems	3
Other	1
Seen no evidence	40
dk/na	6

Subsample: Among those with HVAC air filtration systems that were not originally part of the building (n=133)

Those responsible for buildings with fewer than 1,000 people are more likely to mention fewer occupant complaints. Those responsible for buildings with two or more tenants are more likely to mention results of air quality testing, as are those who say the indoor air quality in their building is very good. Those responsible for smaller buildings (up to 175,000 sq ft) are more likely to mention fresher air. Those responsible for buildings with one tenant are more likely to say there was no decrease in air quality.

Three in ten (28%) building professionals responsible for buildings where the HVAC filtration system has not always been part of the building report that measurements have been taken to record any differences in air quality since the HVAC air cleaner has been operating. *(Q.18)*

Those who give their building's indoor air quality the highest ratings (i.e., "very good") are more likely than others to say they have not taken measurements.

The specific kinds of measurement taken include air quality testing or measurements (70%), particulate matter or dust measurements (32%), CO_2 measurements (16%), humidity measurements (14%) and questionnaires (3%). *(Q.18a)*

Measurements taken of HVAC air filtration impact

	%
Air quality testing/measurements	70
Particulate matter/dust measurements	32
$C0_2$ measurements	16
Humidity measurements	14
Questionnaires	3
Other	3
dk/na	5

Subsample: Among those who have taken measurements to record air quality differences since HVAC air filtration system has been operating (n=37)

PORTABLE AIR CLEANERS

Although the large majority (80%) of building professionals are aware of portable air cleaners, only eight percent – or 10 individual respondents to the survey – say that there are portable air cleaners in their buildings. Due to this very small sample size asked the questions concerning portable air cleaners, only qualitative analysis is possible, and the findings should be viewed with caution. *(Q.19 & 20)*

Selection. The small number of building professionals working in buildings with portable air cleaners (n=10) were asked what factor influenced their decision to choose a particular model (if they were involved in the selection process); this question was asked unprompted, without providing response categories. The reasons include effectiveness (5 respondents), cost (4), suitability for the job (3), energy efficiency (2), ease of use (2), based on a recommendation (1) and reputation (1). One of the respondents was not involved in the decision. *(Q.21)*

About half of these building professionals (4 respondents) have heard of portable air cleaner ratings. *(Q.22)*

Requests. Almost all of the building professionals responsible for buildings with portable air cleaners report that they are used by a very small number (between 0% and 10%) of occupants in their building. *(Q.23)*

About half of these building professionals (4 respondents) say that they have been asked by building occupants if a portable air cleaner will help them with a particular problem or concern related to indoor air quality. *(Q.24a)*

Impact. Half of the building professionals responsible for buildings with portable air cleaners have seen evidence that these devices have positively affected the air quality in their building. This includes fewer occupant health problems (4 respondents) and fewer occupant complaints (2). *(Q.25)*

One of the 10 building professionals reports that measurements have been taken to record any differences since portable air cleaners have been operating. In this one case, air quality testing was the method of measurement. *(Q.26 & 26a)*

HEAT RECOVERY VENTILATORS

Although most (74%) building professionals are aware of heat recovery ventilators, only a minority (24%, or 27 individual respondents to the survey) say that their building has heat recovery ventilators. Due to this small sample size asked questions concerning heat recovery ventilators, only qualitative analysis is possible, and the findings should be viewed with caution. *(Q.27 & 28)*

Selection. Building professionals with heat recovery ventilators in their buildings (n=27) were asked what was the main reason the ventilator was installed (unprompted, without providing response categories). The most common reason is energy conservation and efficiency (15 respondents), followed by improved air quality (5) and reduced cost (3). Two respondents say the heat recovery ventilator has always been part of the building, while three respondents are uncertain the reasons why it was installed. *(Q.29)*

Those who say the heat recovery ventilator was not always part of the building (n=22) were asked what factors influenced the decision to choose a particular model (if they were involved in the selection process); this question was asked unprompted, without providing response categories. Cost (7 respondents) and effectiveness (5) are the most frequently cited reasons, followed by recommendations (1) and ease of maintenance (1). Nine respondents out of the 22 say they were not involved in the decision. *(Q.30)*

Impact. Among building professionals who say that a heat recovery ventilators has not always been part of the building (n=22), only a minority have seen evidence that the ventilator has had a positive impact on indoor air quality. This evidence includes the results of air quality testing (3 respondents) and fewer occupant complaints (1). Fourteen respondents have seen no such evidence and three respondents cannot say. *(Q.31)*

Only a very few of these building professionals (3 of 22) report that measurements have been taken to record any differences since a heat recovery ventilator has been operating. Among those, one case each involved humidity measurements and questionnaires, while the kind of measurement in the third case was unknown. *(Q.31a & 31b)*

AIR DUCT CLEANING

Awareness of air duct cleaning is almost universal among building professionals – 99 percent say they had heard of this prior to the survey. Among those who are aware, most (90%) say they are also aware that air ducts can be contaminated. *(Q.32 & 33)*

Frequency of cleaning

Six in ten building professionals aware of air duct contamination report that the ducts in their buildings have been cleaned. When cleaning does occur, it tends to be infrequent.

Among building professionals who are aware that air ducts can be contaminated, six in ten (58%) report that the ducts in their buildings have been cleaned. Three in ten (31%) say they have not been cleaned, and 11 percent do not know. *(Q.34)*

Building professionals who report that the air ducts in their buildings have been cleaned were asked how often. Air duct cleaning is fairly infrequent, with 15 percent cleaned at least once a year, 13 percent cleaned every other year and half (51%) saying the air ducts are cleaned less often. Six percent say the timing of air duct cleaning varies, while 14 percent do not know how often cleaning occurs. *(Q.35)*

Frequency of air duct cleaning

	%
Every three months	1
Every six months	4
Every year	10
Every other year	13
Less often	51
Depends	6
dk/na	14

Subsample: Among those who report the air ducts in their building have been cleaned (n=78)

Selection of cleaning company/product

The most reasons for choosing an air duct cleaning company or product are cost and reputation.

Building professionals responsible for buildings where the air ducts are cleaned were asked (unprompted, without providing response categories) what factors influenced their decision to choose a particular air duct cleaning company or product (if they were involved in the selection process). The largest proportions mention cost (44%) and reputation (41%). Other factors mentioned include effectiveness (28%), customer service (12%), recommendations (6%), suitability for the job (5%) and ease of use (5%). One-quarter (24%) say they were not involved in the decision. Those responsible for buildings with more people (over 1,000) are more likely than others to have based their decision on customer service. *(Q.36)*

Reasons for choosing air duct cleaning company or product

	%
Cost	44
Reputation	41
Effectiveness	28
Customer service	12
Was recommended	6
Suitability for job	5
Ease of use	5
Based on industry rating scheme	3
Compatibility with other systems	1
Ease of maintenance	1
Quietness	1
Was not involved in decision	24

Subsample: Among those who report the air ducts in their building have been cleaned (n=78)

Impact of air duct cleaning

Half of those who report that their building's air ducts have been cleaned have seen evidence of a positive impact. Three in ten report that specific measurements have been taken, most commonly dust and particulate measurements, and air quality testing.

Among building professionals responsible for buildings where the air ducts are cleaned, half have seen evidence that such cleaning has positively affected the air quality in the building. This evidence includes fewer occupant complaints (19%), better indoor air quality (13%), the results of air quality testing (12%), fresher air (8%), no decrease in air quality (3%) and fewer occupant health problems (1%). Four in ten (41%) have seen no evidence of improvement in indoor air quality, while eight percent are uncertain. *(Q.37)*

Evidence of impact of air duct cleaning on indoor air quality

	%
Fewer occupant complaints	19
Better indoor air quality	13
Results of air quality testing	12
Fresher air	8
No decrease in air quality	3
Fewer occupant health problems	1
Other	3
Seen no evidence	41
dk/na	8

Subsample: Among those who report the air ducts in their building have been cleaned (n=78)

Those responsible for older buildings (pre-1981) are more likely to base their conclusion on the results of air quality testing, while those responsible for newer buildings are more likely to say they have seen no evidence of improvement. Those responsible for buildings with one tenant are more likely to mention better indoor air quality.

Three in ten (29%) building professionals responsible for buildings where the air ducts are cleaned report that measurements have been taken to record any differences in air quality since the HVAC air cleaner has been operating. *(Q.38)*

Among this group (n=23), the specific kinds of measurement taken include particulate matter or dust measurements (12 respondents), air quality testing or measurements (11), CO_2 measurements (1), humidity measurements (1) and questionnaires (1). *(Q.39)*

IAQ INFORMATION

Providing guidance

A majority of building professionals provide guidance on indoor air quality.

Most (74%) building professional professionals say they provide guidance on indoor air quality to the occupants and organizations in their buildings. Those responsible for newer (post-1980) buildings, buildings with more people (more than 1,000), and green-rated buildings tend to be more likely to provide such guidance. *(Q.41)*

Sources of IAQ information

Building professionals are most likely to turn to air quality consultants or building associations when they need more information on indoor air quality.

Building professionals were asked (unprompted, without providing response categories) what sources they have consulted when they require more information on indoor air quality. The most commonly used sources include air quality consultants (39%), and building or air quality companies or organizations (31%). Other sources include ASHRAE (20%), HVAC contractors (17%), building owners, management or maintenance (15%), and government agencies (13%). *(Q.43)*

Sources used for IAQ information

	%
Consultant/air quality consultant	39
Building/air quality companies/associations	31
ASHRAE	20
HVAC provider/people/contractor	17
Building owner/management/maintenance	15
Government agencies	13
Manufacturer	3
National Building Code	2
Other	6
None/nothing	1
dk/na	5

Those responsible for larger buildings (more than 175,000 sq. ft.) are more inclined to turn to consultants and ASHRAE; those responsible for newer (post 1980) buildings are also more likely to have gone to ASHRAE. Those responsible for smaller buildings (up to 175,000 sq. ft.) and buildings with fewer people (up to 1,000) are more likely to consult with HVAC contractors.

SURVEY METHODOLOGY

The results of the research are based on telephone interviews conducted with 150 building professionals, between October 15 and December 3, 2010. A probability sample of this size will provide results accurate to within plus or minus 8.0 percentage points in 19 out of 20 samples.

Questionnaire design

CCIAQB developed a draft questionnaire containing the main content areas to be covered. Environics worked with the project authority to refine the questionnaire, in terms of appropriate response scaling and the flow of question sequencing, as well as adding an appropriate introduction (i.e., providing information about the survey and requesting respondent consent).

The questionnaire was pre-tested in English with a sample of 10 respondents on October 15, 2010, using the same methodology that was used for the final survey. Several questionnaire changes were made following the pre-test, including making the introduction more succinct, clarifying question wording, and adding or revising response categories to pre-coded questions. These changes did not disqualify any information provided by the pre-test participants, and these 10 interviews are included in the final sample.

The questionnaire was finalized and approved by the project authority to go back into field on November 16. At that time, it was translated into French using Environics' professional translators. A copy of the both language versions of the questionnaire are attached as an appendix.

Sample selection

The sampling method was designed to complete 150 interviews with Canadian building managers, property managers and facility managers.

The sample is based on a database provided b the International Facility Managers Association (IFMA), containing a total of 814 unique records. Once duplicate records and records with no contact information (i.e., telephone numbers) were removed, the sample file was sorted by title, with the highest priority given to individuals with the most relevant titles (i.e., facility, property and building managers), and individuals with less relevant titles (e.g., President, Vice President, Architect) placed in reserve.

Within this sample frame, respondents were randomly selected for inclusion in the study. Respondents were screened to ensure that they are directly involved in the management or operation of any buildings or facilities. If an individual provided the name of another person within the organization who was better positioned to answer the survey, then the original contact in the sample was replaced with the alternate person, and all the necessary steps were taken to contact this alternate. To avoid multiple respondents from the same organization, once an individual from one organization had been interviewed, any other contacts from the same organization were removed from the sample list.

No weighting was applied at the data analysis stage, in the absence of accurate population targets upon which to base weights.

Survey administration

Fieldwork was conducted at Environics' central facilities in Toronto. All surveys were conducted in respondents' official language of choice. The average length of time to complete a survey interview was 16 minutes.

Field supervisors were present at all times to ensure accurate interviewing and recording of responses. During fieldwork, 10 percent of each interviewer's work was unobtrusively monitored for quality control. All fieldwork was conducted in accordance with the professional standards established by the Marketing Research and Intelligence Association (MRIA), as well as applicable federal legislation (PIPEDA). A minimum of five calls were made to an individual before classifying it as a "no answer."

Completion results

The effective response rate is 25 percent.[2] This is calculated as the number of responding participants (completed interviews, disqualifications and over-quota participants – 150), divided by unresolved numbers (busy, no answer – 238) plus non-responding organizations or individuals (refusals, language barrier, missed callbacks – 211) plus responding participants (150) [R/(U+IS+R)].

The disposition of all dialled sample is presented in the table on the following page.

[2] This response rate calculation is based on a formula developed by MRIA in consultation with the Government of Canada (Public Works and Government Services).

Completion results

	N
Total sample dialled	625
UNRESOLVED NUMBERS (U)	**238**
Busy	1
No answer	20
Voicemail	217
RESOLVED NUMBERS *(Total minus Unresolved)*	**387**
OUT OF SCOPE *(Invalid/non-eligible)*	26
Non-residential	0
Not-in-service	26
Fax/modem	0
IN SCOPE NON-RESPONDING **(IS)**	**211**
Refusals – organization	5
Refusals – respondent	60
Language barrier	0
Callback missed/respondent not available	144
Break-offs (interview not completed)	2
IN SCOPE RESPONDING **(R)**	**150**
Disqualified	0
Quota filled	0
Completed	150
RESPONSE RATE [R / (U + IS + R)]	**25%**

Sample profile

The following table presents a profile of the final sample by some key building characteristics.

	%
BUILDING AGE	
1910 - 1980	41
1981 - 2010	57
BUILDING SIZE (in sq. ft.)	
Up to 175,000	45
176,000 sq. ft. and up	50
NO. OF ORGANIZATIONS	
One	53
2 to 5	25
6 to 10	5
11 to 20	5
21 or more	11
NO. OF OCCUPANTS	
Less than 250	19
250 to less than 500	24
500 to less than 1,000	24
1,000 to less than 2,000	16
2,000 or more	14
BUILDING USES	
Offices	73
Health care (clinics, etc.)	15
Government	14
Light industrial	13
Retail space	10
Food services/restaurants	9
Educational facilities/schools	9
Other	14
IS BUILDING GREEN-RATED?	
Yes	22
No	74
dk/na	4

APPENDIX A

Canadian Committee on Indoor Air Quality and Buildings
Survey on Indoor Air and Improvement Strategies

FINAL Questionnaire

Introduction

Good morning/afternoon. May I please speak with CONTACT NAME?

IF PERSON IS NOT AVAILABLE, ARRANGE FOR CALL-BACK
IF PERSON IS NO LONGER WITH THE COMPANY, ASK TO SPEAK TO A BUILDING OR FACILITY MANGER IN THE ORGANIZATION

IF ASKED WHAT THE CALL IS ABOUT: We are conducting a survey with building professionals on behalf of the Canadian Committee on Indoor Air Quality and Buildings.

WHEN RESPONDENT IS REACHED INTRODUCE:

Hello, my name is _____ and I am calling from the Environics Research Group, a professional research company. Today we are conducting a survey with building professionals about indoor air quality, on behalf of the Canadian Committee on Indoor Air Quality and Buildings.

Are you, yourself, directly involved in the management or operation of any buildings or facilities?

01 – Yes
02 – No ASK IF THERE IS A BULDING OR FACILITY MANAGER IN THEIR ORGANIZATION & ASK FOR NAME/CONTACT INFORMATION

Please be assured that we are not selling or soliciting anything. Participation is voluntary, and your responses will be kept strictly confidential and anonymous. The NRC's Research Ethics Board has approved this survey. Do I have your consent to continue?

01 – Yes
02 – No THANK AND TERMINATE

IF ASKED: Your name was on a list provided to us by the International Facility Managers Association, solely for the purpose of this survey.

IF ASKED: This study is approved by the NRC's Research Ethics Board as Protocol 2010-27

IF ASKED: The survey will take about 15 minutes to complete

IF ASKED: You can get more information about this survey by contacting Luc St-Martin at the National Research Council at 613-993-7844.

IF ASKED: This survey is registered with the National Survey Registration system, which has been created by the Canadian survey research industry to allow the public to verify that a survey is legitimate, get information about the survey industry or register a complaint. The registration system's toll-free telephone number is 1-800-554-9996.

SAY: *If you manage more than one building, please answer the questions for the largest one.*

General IAQ Knowledge

1. As a service provider, what is your impression of the indoor air quality in your building over a typical year?
   READ – RECORD ONE ONLY

   01 – Very poor
   02 – Poor
   03 – Slightly poor
   04 – Neither poor nor good
   05 – Slightly good
   06 – Good
   07 – Very good
   VOLUNTEERED
   99 – DK/NA

2. Talking generally now, which of the following is the best way to improve indoor air quality in buildings?
   READ AND RANDOMIZE – RECORD ONE ONLY

   01 – Pollutant source control
   02 – Increase ventilation
   03 – Air cleaning
   VOLUNTEERED
   99 – DK/NA

   PROVIDE DEFINITIONS ONLY IF ASKED:
   Pollutant source control: This means improving air quality by selecting equipment/material that emits fewer pollutants.
   Increase ventilation: This means improving air quality by increasing the air supply rate to remove pollutants.
   Air cleaning: This means improving air quality by removing pollutants with a specific device

3. A building's air quality can be improved through design features and equipment, or through maintenance techniques or procedures. I'd like to ask you now about maintenance.

   To the best of your knowledge, what kinds of maintenance techniques or maintenance procedures can be used for improving the air quality in buildings?
   DO NOT READ – RECORD ALL THAT APPLY
   PROBE: Any others?

   01 – Duct cleaning
   02 – Changing the air filter(s)
   03 – Cleaning with low emission products
   04 – Cleaning with standard products
   05 – Humidification
   06 – Dehumidification
   07 – Using air fresheners
   08 – Increasing ventilation rates/amount of fresh or outdoor air intake
   98 - Other (SPECIFY)_____
   99 – DK/NA

4. How effective are each of the following maintenance procedures in improving the air quality in buildings? Are they very effective, somewhat effective, not very effective or not at all effective? Starting with…
READ AND RANDOMIZE – ALWAYS KEEP D/E TOGETHER

a. Duct cleaning

b. Changing the air filter

d. Cleaning with a low emission product

e. Cleaning with standard products

f. Using air fresheners

g. Using a humidifier

h. Using a dehumidifier

j. Increasing the amount of fresh or outdoor air intake

i. INSERT UP TO TWO ITEMS MENTIONED AT Q.3 CODE 98

01 – Very effective
02 – Somewhat effective
03 – Not very effective
04 – Not at all effective
VOLUNTEERED
99 – DK/NA

5. Are each of the following indoor air quality pollutants very harmful, somewhat harmful, not very harmful or not at all harmful to human health?
READ AND RANDOMIZE

a. Second-hand tobacco smoke

b. Formaldehyde

c. Dust and particles

d. Bacteria and mold

e. Volatile organic compounds or VOCs

f. Cosmetic scents and odours

01 – Very harmful
02 – Somewhat harmful
03 – Not very harmful
04 – Not at all harmful
VOLUNTEERED
99 – DK/NA

Building Status

Now I have some questions about your building or facility…

6. Do the tenants in your building report their health issues related to indoor air quality?

   01 – Yes
   02 – No SKIP TO Q.8
   99 – DK/NA SKIP TO Q.8

7. What health issues related to indoor air quality have they reported?
   DO NOT READ – RECORD ALL THAT APPLY
   PROBE: Any others?

   01 – Colds & flu
   02 – Headaches
   03 – Asthma
   04 – Cough
   05 – Nausea
   06 – Allergic reactions
   07 – Stress
   08 – Skin irritation/rashes
   09 – Fatigue
   10 – Dry eyes
   11 – Stuffy nose
   12 – Sick building syndrome (SBS) symptoms
   98 - Other (SPECIFY)_____
   99 – DK/NA

8. To the best of your knowledge, what source or sources of indoor air quality pollution has the greatest impact on health or complaints about health in your building?
   DO NOT READ – RECORD ALL THAT APPLY
   PROBE: Any others?

   01 – Second-hand tobacco smoke
   02 – Formaldehyde
   03 – Dust/particles
   04 – Bacteria or mold
   05 – Volatile organic compounds (VOCs)
   06 – Cosmetic scents and odours
   98 - Other (SPECIFY)_____
   99 – DK/NA

9. Are you able to reduce the concentrations of the following pollutants in your building?
READ AND RANDOMIZE

a. Second-hand tobacco smoke

b. Formaldehyde

c. Dust and particles

d. Bacteria and mold

e. Volatile organic compounds or VOCs

f. Cosmetic scents and odours

g. INSERT UP TO TWO ITEMS MENTIONED AT Q.8 CODE 98

01 – Yes
02 – No
VOLUNTEERED
03 – Not a problem in my building
99 – DK/NA

10. Are there design features or indoor air quality devices incorporated into your building to address indoor air quality?
DO NOT READ – RECORD ALL THAT APPLY
PROBE: Any others?

01 – Humidifier/humidification
02 – Dehumidifier/dehumidification
03 – Heat-recovery ventilator
06 – Air fresheners
07 – Air quality or CO_2 sensors/monitoring system/demand control ventilation
09 – Location of air intake
10 – Entrance mats/Entranceway track off system
15 – Air filtration/filters (unspecified)
11 – HVAC air filtration
12 – HVAC cycling/scheduling
13 – Plants/living wall
14 – HEPA filters
98 - Other (SPECIFY)_____
97 – No, none
99 – DK/NA

11. To the best of your knowledge, are there design features or devices to address indoor air quality that are missing from your building?
DO NOT READ – RECORD ALL THAT APPLY
PROBE: Any others?

01 – Humidifier/humidification
02 – Dehumidifier/dehumidification
03 – Heat-recovery ventilator
06 – Air fresheners
07 – Air quality or CO_2 sensors/monitoring system/demand control ventilation
09 – Location of air intake
10 – Entrance mats/Entranceway track off system
11 – Air filtration/HVAC air filtration/filters
12 – HVAC cycling/scheduling
13 – Plants/living wall
14 – HEPA filters
98 - Other (SPECIFY)_____
97 – No, none
99 – DK/NA

FOR UP TO TWO ITEMS RANDOMLY CHOSEN AT Q.11, ASK:

12. What are the reasons why your building does not have [INSERT FEATURE FROM Q.11]?
DO NOT READ – RECORD ALL THAT APPLY

01 – Too expensive
02 – Short-term tenant
03 – Tenant requires specialized system
04 – Too big
05 – Too inefficient
06 – Not responsibility of building operator
07 – Not in contract
08 – Too difficult to maintain
09 – Design issue
10 – Building age
98 - Other (SPECIFY)_____
99 – DK/NA

The next few questions are about some specific indoor air quality devices…

Central HVAC Air Filtration Systems

IF HAVE HVAC AIR FILTRATION (CODE 11 AT Q.10), SAY: You mentioned earlier that your building has central HVAC air filtration. THEN GO TO Q.14. OTHERWISE ASK Q.13.

13. Does your building have central HVAC *(pronounced H-vac)* air filtration?
IF ASKED: HVAC stands for Heating, Ventilating and Air Conditioning

01 – Yes
02 – No SKIP TO Q.19
99 – DK/NA SKIP TO Q.19

14. If you were involved in choosing the HVAC air filtration system, what factors influenced your decision to choose that particular model?
DO NOT READ – RECORD ALL THAT APPLY

01 – Cost
02 – Effectiveness
03 – Suitability for job
04 – Compatibility with other systems
05 – Was recommended
06 – Based on industry rating scheme
07 – Energy-efficiency
08 – Ease of maintenance
09 – Quietness
10 – Ease of use
11 – Customer service
12 – Reputation
98 - Other (SPECIFY)_____
96 – Has always been part of the building
97 – Was not involved in decision
99 – DK/NA

15. Have you ever heard of HVAC air filtration rating schemes?

01 – Yes
02 – No
99 – DK/NA

16. About how often is the filtration system maintained?
READ <u>ONLY IF NECESSARY</u> - RECORD ONE ONLY

09 – Weekly
10 – Biweekly
01 – Monthly
02 – Every other month
03 – Every three months
04 – Every six months
05 – Every year
06 – Every other year
07 – Less often
08 – Never
VOLUNTEERED
99 – DK/NA

IF HVAC SYSTEM HAS ALWAYS BEEN PART OF BUILDING (Q.14 CODE 96), SKIP TO Q.19

17. What evidence have you seen that the indoor air quality in the building has improved since the HVAC air filtration system has been operating?
DO NOT READ – RECORD ALL THAT APPLY

01 – Results of air quality testing
02 – Fewer occupant complaints
03 – Fewer occupant health problems
04 – Better indoor air quality
05 – Fresher air
06 – No decrease in air quality
98 - Other (SPECIFY)_____
97 – Seen no evidence
99 – DK/NA

18. Have any measurements been taken to record any differences now the HVAC air filtration system has been operating?

01 – Yes
02 – No SKIP TO Q.19
99 – DK/NA SKIP TO Q.19

18a. What kind of measurements have been taken?
DO NOT READ – RECORD ALL THAT APPLY

01 – Air quality testing/measurements
02 – CO_2 measurements
03 – Particulate matter/dust measurements
04 – Humidity measurements
05 – Questionnaires
98 - Other (SPECIFY)_____
99 – DK/NA

Portable Air Cleaners

19. Prior to this survey, had you ever heard of portable air cleaners?

    01 – Yes
    02 – No SKIP TO Q.27
    99 – DK/NA SKIP TO Q.27

20. Does your building have any portable air cleaners?

    01 – Yes
    02 – No SKIP TO Q.27
    99 – DK/NA SKIP TO Q.27

21. If you were involved in choosing the portable air cleaner, what factors influenced your decision to choose that particular model?
    DO NOT READ – RECORD ALL THAT APPLY

    01 – Cost
    02 – Effectiveness
    03 – Suitability for job
    04 – Compatibility with other systems
    05 – Was recommended
    06 – Based on industry rating scheme
    07 – Energy-efficiency
    08 – Ease of maintenance
    09 – Quietness
    10 – Ease of use
    11 – Customer service
    12 – Reputation
    98 - Other (SPECIFY)_____
    97 – Was not involved in decision
    99 – DK/NA

22. Have you ever heard of portable air cleaner ratings?

    01 – Yes
    02 – No
    99 – DK/NA

23. What percentage of the occupants in your building use portable air cleaners?
    READ ONLY IF REQUIRED TO CLARIFY

    01 – 0-10%
    02 – 11-20%
    03 – 21-30%
    04 – 31-40%
    05 – 41-50%
    06 – 51-60%
    07 – 61-70%
    08 – 71-80%
    09 – 81-90%
    10 – 91-100%
    VOLUNTEERED
    99 – DK/NA

24a. Have you been asked by building occupants if a portable air cleaner will help them with a particular problem or concern related to indoor air quality?

01 – Yes
02 – No SKIP TO Q.25
99 – DK/NA SKIP TO Q.25

24b. What type of problem were they concerned about, that led them to ask you about portable air cleaners?

01 – RECORD VERBATIM
99 – DK/NA

25. What evidence have you seen that the indoor air quality in the building has improved since a portable air cleaner has been operating?
DO NOT READ – RECORD ALL THAT APPLY

01 – Results of air quality testing
02 – Fewer occupant complaints
03 – Fewer occupant health problems
04 – Better indoor air quality
05 – Fresher air
06 – No decrease in air quality
98 - Other (SPECIFY)_____
97 – Seen no evidence
99 – DK/NA

26. Have any measurements been taken to record any differences now that a portable air cleaner has been operating?

01 – Yes
02 – No SKIP TO NEXT SECTION
99 – DK/NA SKIP TO NEXT SECTION

26a. What kind of measurements have been taken?
DO NOT READ – RECORD ALL THAT APPLY

01 – Air quality testing/measurements
02 – CO_2 measurements
03 – Particulate matter/dust measurements
04 – Humidity measurements
05 – Questionnaires
98 - Other (SPECIFY)_____
99 – DK/NA

Heat Recovery Ventilator

IF HAVE HRV (CODE 3 AT Q.10), SAY: You mentioned earlier that your building has a heat recovery ventilator. THEN GO TO Q.29.

IF ALREADY SPECIFICED THAT DO NOT HAVE HRV (CODE 3 AT Q.11), SKIP TO Q.32

OTHERWISE, ASK Q.27

27. Prior to this survey, had you ever heard of a heat recovery ventilator?

    01 – Yes
    02 – No SKIP TO Q.32
    99 – DK/NA SKIP TO Q.32

28. Does your building have any heat recovery ventilators?

    01 – Yes
    02 – No SKIP TO Q.32
    99 – DK/NA SKIP TO Q.32

29. What are the main reasons a heat recover ventilator was installed?

    01 – RECORD VERBATIM
    97 – Has always been part of the building SKIP TO Q.32
    99 – DK/NA

30. If you were involved in choosing the heat recovery ventilator, what factors influenced your decision to choose that particular model?
    DO NOT READ – RECORD ALL THAT APPLY

    01 – Cost
    02 – Effectiveness
    03 – Suitability for job
    04 – Compatibility with other systems
    05 – Was recommended
    06 – Based on industry rating scheme
    07 – Energy-efficiency
    08 – Ease of maintenance
    09 – Quietness
    10 – Ease of use
    11 – Customer service
    12 – Reputation
    98 - Other (SPECIFY)_____
    96 – Has always been part of the building SKIP TO Q.32
    97 – Was not involved in decision
    99 – DK/NA

31. What evidence have you seen that the indoor air quality in the building has improved since using a heat recovery ventilator?
DO NOT READ – RECORD ALL THAT APPLY

01 – Results of air quality testing
02 – Fewer occupant complaints
03 – Fewer occupant health problems
04 – Better indoor air quality
05 – Fresher air
06 – No decrease in air quality
98 - Other (SPECIFY)_____
97 – Seen no evidence
99 – DK/NA

31a. Have any measurements been taken to record any differences now that a heat recovery ventilator has been operating?

01 – Yes
02 – No SKIP TO Q.32
99 – DK/NA SKIP TO Q.32

31b. What kind of measurements have been taken?
DO NOT READ – RECORD ALL THAT APPLY

01 – Air quality testing/measurements
02 – CO_2 measurements
03 – Particulate matter/dust measurements
04 – Humidity measurements
05 – Questionnaires
98 - Other (SPECIFY)_____
99 – DK/NA

Air Duct Cleaning

32. Prior to this survey, had you ever heard of air duct cleaning?

    01 – Yes
    02 – No SKIP TO Q.40
    99 – DK/NA SKIP TO Q.40

33. In general, are you aware that air ducts might be contaminated?

    01 – Yes
    02 – No SKIP TO Q.40
    99 – DK/NA SKIP TO Q.40

34. Have the air ducts in your building ever been cleaned?

    01 – Yes
    02 – No SKIP TO Q.40
    99 – DK/NA SKIP TO Q.40

35. How often are the air ducts cleaned?
    READ AND RECORD ONE ONLY

    01 – Monthly
    02 – Every other month
    03 – Every three months
    04 – Every six months
    05 – Every year
    06 – Every other year
    07 – Less often
    VOLUNTEERED
    98 – Depends
    99 – DK/NA

36. If you were involved in choosing the air duct cleaning company or product, what factors influenced your decision to choose that particular company or product?
    DO NOT READ LIST – RECORD ALL THAT APPLY

    01 – Cost
    02 – Effectiveness
    03 – Suitability for job
    04 – Compatibility with other systems
    05 – Was recommended
    06 – Based on industry rating scheme
    07 – Energy-efficiency
    08 – Ease of maintenance
    09 – Quietness
    10 – Ease of use
    11 – Customer service
    12 – Reputation
    98 - Other (SPECIFY)_____
    97 – Was not involved in decision
    99 – DK/NA

37. What evidence have you seen that the indoor air quality in the building has improved since having the air ducts cleaned?
DO NOT READ – RECORD ALL THAT APPLY

01 – Results of air quality testing
02 – Fewer occupant complaints
03 – Fewer occupant health problems
04 – Better indoor air quality
05 – Fresher air
06 – No decrease in air quality
98 - Other (SPECIFY)_____
97 – Seen no evidence
99 – DK/NA

38. Have any measurements been taken to record any differences after the air ducts have been cleaned?

01 – Yes
02 – No SKIP TO Q.40
99 – DK/NA SKIP TO Q.40

39. What kind of measurements have been taken?
DO NOT READ – RECORD ALL THAT APPLY

01 – Air quality testing/measurements
02 – CO_2 measurements
03 – Particulate matter/dust measurements
04 – Humidity measurements
05 – Questionnaires
98 - Other (SPECIFY)_____
99 – DK/NA

On a slightly different topic...

40. Who has responsibility for ensuring good indoor air quality in your building?
DO NOT READ – RECORD ALL THAT APPLY
PROBE: Anyone else?

01 – Facility manager
02 – Building supervisor
03 – Property manager
04 – Contractors' firm
05 – Janitor
06 – HVAC contractor
07 – Occupants
08 – Building owner/landlord
09 – Occupational health and safety
10 – Building operator
11 – Operations department
98 - Other (SPECIFY)_____
99 – DK/NA

IAQ Information

41. Do you provide guidance on indoor air quality to the occupants or organizations in your building?

    01 – Yes
    02 – No
    99 – DK/NA

42. DELETED

43. When you require more information on indoor air quality, to whom or to what organizations have you gone? DO NOT READ – RECORD ALL THAT APPLY

    01 – ASHRAE (*pronounced Ash-ray*)
    02 – Consultant/air quality consultant
    03 – Manufacturer
    04 – HVAC provider/people/contractor
    05 – National Building Code
    98 - Other (SPECIFY)_____
    99 – DK/NA

Building Characteristics

Finally, I would like to ask a few questions about your building that will help us analyze the results of this survey.

A. In what year was your building built?

___ ___ ___ ___
99-DK/NA

B. What is the size of your building in square feet?
ACCEPT AN ESTIMATE BUT NOT A RANGE

___ ___ ___ thousand square feet
99-DK/NA

C. Approximately how many different organizations are in your building? Would you say…?
READ. STOP WHEN REACH APPROPRIATE CATEGORY.

01 – One
02 – 2 to 5
03 – 6 to 10
04 – 11 to 20
05 – 21 or more
VOLUNTEERED
99 – DK/NA

D. Approximately how many people are in your building? Would you say…?
READ. STOP WHEN REACH APPROPRIATE CATEGORY.

01 – Less than 250
02 – 250 to less than 500
03 – 500 to less than 1,000
04 – 1,000 to less than 2,000
05 – 2,000 to less than 5,000
06 – 5,000 to less than 10,000
07 – 10,000 or more
VOLUNTEERED
99 – DK/NA

E. What types of uses do you have in your building?
READ ONLY IF REQUIRED TO CLARIFY - RECORD ALL THAT APPLY

01 – Cinemas and performing arts
02 – Food services/restaurants
03 – Offices
04 – Retail space
05 – Residential units
06 – Hotel accommodation
07 – Educational facilities/schools
08 – Health care (clinics, medical services)
09 – Light industrial (including information technology services)
10 – Government
VOLUNTEERED
98 - Other (SPECIFY)_____
99 – DK/NA

F. Is your building green-rated?

01 – Yes
02 – No
99 – DK/NA

This completes the survey. On behalf of the Canadian Committee on Indoor Air Quality and Buildings, thank you very much for your participation.

IF RESPONDENT ASKS FOR INFORMATION ABOUT THIS SURVEY: You can get more information about this survey by contacting Luc St-Martin at the National Research Council at 613-993-7844.

RECORD FROM SAMPLE:

G. CITY

H. PROVINCE/TERRITORY

Comité canadien sur la qualité de l'air intérieur et les bâtiments
Sondage sur la qualité de l'air intérieur et sur les stratégies d'amélioration

Questionnaire FINAL

Introduction

Bonjour/bonsoir, puis-je parler à NOM DE LA PERSONNE?

SI LA PERSONNE N'EST PAS DISPONIBLE, PLANIFIER UN MOMENT POUR RAPPELER
SI LA PERSONNE NE TRAVAILLE PLUS AU SEIN DE L'ENTREPRISE, DEMANDEZ À PARLER AU GÉRANT D'IMMEUBLES OU À L'ADMINISTRATEUR DES INSTALLATIONS DE L'ORGANISATION

SI ON VOUS DEMANDE À QUEL SUJET VOUS APPELEZ : Nous menons un sondage auprès des professionnels en bâtiment au nom du Comité canadien sur la qualité de l'air intérieur et les bâtiments.

LORSQUE VOUS RÉUSSISSEZ À CONTACTER LA PERSONNE, PRÉSENTEZ-VOUS :

Bonjour, je suis _____ et j'appelle de la part d'Environics Research Group, une société d'étude de marché. Aujourd'hui, nous menons un sondage auprès des professionnels en bâtiment au sujet de la qualité de l'air intérieur au nom du Comité canadien sur la qualité de l'air intérieur et les bâtiments.

Participez-vous directement à la gestion ou à l'exploitation d'immeubles ou d'installations?

01 – Oui
02 – Non DEMANDEZ S'IL PEUT VOUS DONNER LE NOM OU LES RENSEIGNEMENTS DU GÉRANT D'IMMEUBLES OU DE L'ADMINISTRATEUR DES INSTALLATIONS DE L'ORGANISATION

Sachez que nous ne faisons pas de vente ni de sollicitation pour quoi que ce soit. Votre participation est volontaire et vos réponses demeureront strictement confidentielles et anonymes. Les membres du comité d'éthique de la recherche du CNRC ont approuvé ce sondage. Consentez-vous à ce que je continue?

01 – Oui
02 – Non REMERCIEZ ET TERMINEZ

SI ON VOUS LE DEMANDE : Votre nom était sur une liste que l'International Facility Managers Association nous a fournie uniquement pour les besoins de ce sondage.

SI ON VOUS LE DEMANDE : Cette étude a été approuvée par les membres du comité d'éthique de la recherche du CNRC en tant que Protocol 2010-27.

SI ON VOUS LE DEMANDE : Le sondage durera environ 15 minutes.

SI ON VOUS LE DEMANDE : Vous pouvez obtenir plus d'informations au sujet de ce sondage en communiquant avec Luc St-Martin du CNRC au 613-993-7844.

SI ON VOUS LE DEMANDE : Ce sondage est inscrit dans le système national d'inscription des sondages, mis sur pied par l'industrie canadienne de recherche par sondages, afin de permettre au public de vérifier la légitimité d'un sondage, d'obtenir plus de renseignements au sujet de l'industrie des sondages ou de déposer une plainte. Le numéro sans frais du système d'enregistrement est le 1-800-554-9996.

DITES : *Si vous gérez plus d'un immeuble, répondez aux questions en faisant référence au plus grand de vos immeubles.*

Connaissances générales au sujet de la qualité de l'air intérieur

1. En tant que fournisseur de services, que pensez-vous de la qualité de l'air intérieur au cours d'une année typique?
   LISEZ – NOTEZ UNE SEULE RÉPONSE

   01 – Très mauvaise
   02 – Mauvaise
   03 – Légèrement mauvaise
   04 – Ni bonne ni mauvaise
   05 – Légèrement bonne
   06 – Bonne
   07 – Très bonne
   NON SUGGÉRÉ
   99 – NSP/SO

2. De façon générale, laquelle des solutions suivantes est la plus efficace pour améliorer la qualité de l'air intérieur dans les immeubles?
   LISEZ ET RANDOMISEZ – NOTEZ UNE SEULE RÉPONSE

   01 – Contrôler les sources de polluants
   02 – Augmenter la ventilation
   03 – Épurer l'air
   NON SUGGÉRÉ
   99 – NSP/SO

   FOURNISSEZ LES DÉFINITIONS SUIVANTES UNIQUEMENT SI ON VOUS LE DEMANDE :
   Contrôle des sources de polluants : améliorer la qualité de l'air en choisissant du matériel ou des matières qui émanent moins d'agents polluants.
   Augmenter la ventilation : améliorer la qualité de l'air en augmentant le taux d'apport d'air dans le but d'éliminer les agents polluants.
   Épurer l'air : améliorer la qualité de l'air en éliminant les agents polluants à l'aide d'un appareil précis.

3. On peut améliorer la qualité de l'air d'un immeuble à l'aide de matériel ou de caractéristiques techniques ou encore par des techniques ou des méthodes d'entretien. J'aimerais maintenant vous poser des questions au sujet de l'entretien.

   À votre connaissance, quels types de techniques ou de méthodes d'entretien peut-on utiliser pour améliorer la qualité de l'air dans les immeubles?
   NE LISEZ PAS – NOTEZ TOUTES LES RÉPONSES APPLICABLES
   EXPLOREZ : Y en a-t-il d'autres?

   01 – Nettoyer les conduits
   02 – Changer le(s) filtre(s) à air
   03 – Nettoyer avec des produits ayant un faible taux d'émissions
   04 – Nettoyer avec des produits courants
   05 – Humidification
   06 – Déshumidification
   07 – Utiliser des assainisseurs d'air
   08 – Augmenter les taux de ventilation/augmenter l'apport d'air frais ou d'air provenant de l'extérieur
   98 - Autre (PRÉCISEZ)_____
   99 – NSP/SO

4. À quel point chacune des méthodes d'entretien suivantes est-elle efficace pour améliorer la qualité de l'air dans les immeubles? Est-elle très efficace, plutôt efficace, pas très efficace ou pas du tout efficace? Commençons par…
LISEZ ET RANDOMISEZ – GARDEZ TOUJOURS D/E ENSEMBLE

   a. Nettoyer les conduits

   b. Changer le filtre à air

   d. Nettoyer avec des produits ayant un faible taux d'émissions

   e. Nettoyer avec des produits courants

   f. Utiliser des assainisseurs d'air

   g. Utiliser un humidificateur

   h. Utiliser un déshumidificateur

   j. Augmenter l'apport d'air frais ou d'air provenant de l'extérieur

   i. INSÉREZ UN MAXIMUM DE DEUX ÉLÉMENTS MENTIONNÉS À Q.3 CODE 98

   01 – Très efficace
   02 – Plutôt efficace
   03 – Pas très efficace
   04 – Pas du tout efficace
   NON SUGGÉRÉ
   99 – NSP/SO

5. Veuillez indiquer pour chacun des polluants de l'air intérieur suivants s'il est très néfaste, plutôt néfaste, pas très néfaste ou pas du tout néfaste pour la santé?
LISEZ ET RANDOMISEZ

   a. La fumée secondaire provenant du tabac

   b. Le formaldéhyde

   c. La poussière et les particules

   d. Les bactéries et la moisissure

   e. Les composés organiques volatils ou COV

   f. Les désodorisants d'intérieur

   01 – Très néfaste
   02 – Plutôt néfaste
   03 – Pas très néfaste
   04 – Pas du tout néfaste
   NON SUGGÉRÉ
   99 – NSP/SO

État de l'immeuble

J'aimerais maintenant vous poser des questions au sujet de votre immeuble ou de votre installation…

6. Est-ce que les locataires de votre immeuble vous signalent leurs problèmes de santé en lien avec la qualité de l'air intérieur?

   01 – Oui
   02 – Non PASSEZ À Q.8
   99 – NSP/SO PASSEZ À Q.8

7. Quels problèmes de santé reliés à la qualité de l'air intérieur vous ont-ils rapportés?
   NE LISEZ PAS – NOTEZ TOUTES LES RÉPONSES APPLICABLES
   EXPLOREZ : Y en a-t-il d'autres?

   01 – Rhumes et grippes
   02 – Maux de tête
   03 – Asthme
   04 – Toux
   05 – Nausée
   06 – Réactions allergiques
   07 – Stress
   08 – Irritation cutanée/éruptions cutanées
   09 – Fatigue
   10 – Yeux secs
   11 – Congestion nasale
   12 – Symptômes du syndrome des bâtiments malsains
   98 - Autre (PRÉCISEZ)_____
   99 – NSP/SO

8. À votre connaissance, quels polluants de l'air intérieur ont le plus d'impact sur la santé ou génèrent le plus de plaintes concernant la santé dans votre immeuble?
   NE LISEZ PAS – NOTEZ TOUTES LES RÉPONSES APPLICABLES
   EXPLOREZ : Y en a-t-il d'autres?

   01 – La fumée secondaire provenant du tabac
   02 – Le formaldéhyde
   03 – La poussière et les particules
   04 – Les bactéries et la moisissure
   05 – Les composés organiques volatils ou COV
   06 – Les désodorisants d'intérieur
   98 - Autre (PRÉCISEZ)_____
   99 – NSP/SO

9. Êtes-vous capable de réduire les concentrations des polluants suivants dans votre immeuble?
LISEZ ET RANDOMISEZ

a. La fumée secondaire provenant du tabac

b. Le formaldéhyde

c. La poussière et les particules

d. Les bactéries et la moisissure

e. Les composés organiques volatils ou COV

f. Les désodorisants d'intérieur

g. INSÉREZ UN MAXIMUM DE DEUX ÉLÉMENTS MENTIONNÉS À Q.8 CODE 98

01 – Oui
02 – Non
NON SUGGÉRÉ
03 – Ne représente pas un problème dans mon immeuble
99 – NSP/SO

10. Votre immeuble a-t-il des caractéristiques techniques ou des appareils destinés à améliorer la qualité de l'air intérieur?
NE LISEZ PAS – NOTEZ TOUTES LES RÉPONSES APPLICABLES
EXPLOREZ : Y en a-t-il d'autres?

01 – Humidificateur/humidification
02 – Déshumidificateur/déshumidification
03 – Ventilateur-récupérateur de chaleur
06 – Assainisseurs d'air
07 – Détecteurs de CO_2 ou de la qualité de l'air/système de surveillance/contrôle de la ventilation sur demande
09 – Emplacement de l'entrée d'air
10 – Paillassons/Système de détection à l'entrée
15 – Filtration d'air/filtres (non précisé)
11 – Filtration d'air CVCA
12 – Programmation du CVCA
13 – Plantes/mur végétal
14 – Filtre absolu
98 - Autre (PRÉCISEZ)_____
97 – Non, aucun
99 – NSP/SO

11. À votre connaissance, trouvez-vous que votre immeuble manque de caractéristiques techniques ou d'appareils destinés à améliorer la qualité de l'air intérieur?
NE LISEZ PAS – NOTEZ TOUTES LES RÉPONSES APPLICABLES
EXPLOREZ : Y en a-t-il d'autres?

01 – Humidificateur/humidification
02 – Déshumidificateur/déshumidification
03 – Ventilateur-récupérateur de chaleur
06 – Assainisseurs d'air
07 – Détecteurs de CO_2 et de la qualité de l'air/système de surveillance/contrôle de la ventilation sur demande
09 – Emplacement de l'entrée d'air
10 – Paillassons/Système de détection à l'entrée
15 – Filtration d'air/filtres (non précisé)
11 – Filtration d'air CVCA
12 – Programmation du CVCA
13 – Plantes/mur végétal
14 – Filtre absolu
98 - Autre (PRÉCISEZ)_____
97 – Non, aucun
99 – NSP/SO

POUR UN MAXIMUM DE DEUX ÉLÉMENTS CHOISIS DE FAÇON ALÉATOIRE À Q.11, POSEZ :

12. Pour quelles raisons votre immeuble n'a-t-il pas de [INSÉREZ LA CARACTÉRISTIQUE DE Q.11]?
NE LISEZ PAS – NOTEZ TOUTES LES RÉPONSES APPLICABLES

01 – Trop dispendieux
02 – Locataires à court terme
03 – Le locataire a besoin d'un système spécialisé
04 – Trop gros
05 – Trop inefficace
06 – Ce n'est pas la responsabilité du technicien d'immeuble
07 – Pas dans le contrat
08 – Trop difficile à entretenir
09 – C'est une question de conception
10 – L'immeuble est vieux
98 - Autre (PRÉCISEZ)_____
99 – NSP/SO

Les prochaines questions porteront sur certains appareils qui permettent d'améliorer la qualité de l'air intérieur…

Systèmes centraux de filtration d'air CVCA

S'IL A UNE FILTRATION D'AIR CVCA (CODE 11 À Q.10), DITES : Vous avez mentionné plus tôt que votre immeuble a un système central de filtration d'air CVCA. PUIS PASSEZ À Q.14. SINON POSEZ Q.13.

13. Est-ce que votre immeuble est muni d'un système central de filtration d'air CVCA *(prononcé H-vac)*?
S'IL LE DEMANDE : CVCA signifie chauffage, ventilation et conditionnement d'air

01 – Oui
02 – Non PASSEZ À Q.19
99 – NSP/SO PASSEZ À Q.19

14. Si vous participiez au choix d'un système de filtration d'air CVCA, quels facteurs influenceraient votre choix d'un modèle en particulier?
NE LISEZ PAS – NOTEZ TOUTES LES RÉPONSES APPLICABLES

01 – Coût
02 – Efficacité
03 – Parfait pour cette tâche
04 – Compatible avec d'autres systèmes
05 – On me l'a recommandé
06 – Selon le système de classification de l'industrie
07 – Efficacité énergétique
08 – Facile à entretenir
09 – Peu bruyant
10 – Facile à utiliser
11 – Service à la clientèle
12 – Réputation
98 - Autre (PRÉCISEZ)_____
96 – Il a toujours fait partie de l'immeuble
97 – Je ne participe pas au processus décisionnel
99 – NSP/SO

15. Avez-vous déjà entendu parler du système de classification des systèmes de filtration d'air CVCA?

01 – Oui
02 – Non
99 – NSP/SO

16. À quelle fréquence entretenez-vous le système de filtration d'air?
LISEZ SEULEMENT SI NÉCESSAIRE – NOTEZ UNE SEULE RÉPONSE

09 – Une fois par semaine
10 – Une fois aux deux semaines
01 – Une fois par mois
02 – Une fois tous les deux mois
03 – Une fois tous les trois mois
04 – Une fois tous les six mois
05 – Une fois par année
06 – Une fois tous les deux ans
07 – Moins souvent
08 – Jamais

NON SUGGÉRÉ
99 – NSP/SO

SI LE SYSTÈME CVCA A TOUJOURS FAIT PARTIE DE L'IMMEUBLE (Q.14 CODE 96), PASSEZ À Q.19

17. Quels changements positifs en lien avec la qualité de l'air intérieur avez-vous remarqués depuis qu'un système de filtration d'air CVCA est en fonction?
NE LISEZ PAS – NOTEZ TOUTES LES RÉPONSES APPLICABLES

01 – Les résultats des tests sur la qualité de l'air
02 – Les occupants font moins de plaintes
03 – Les occupants ont moins de problèmes de santé
04 – Meilleure qualité de l'air intérieur
05 – L'air est plus frais
06 – Aucune diminution de la qualité de l'air
98 - Autre (PRÉCISEZ)_____
97 – Je n'ai vu aucun changement
99 – NSP/SO

18. Avez-vous mesuré la qualité de l'air afin de noter les changements apportés depuis l'installation du système de filtration d'air CVCA?

01 – Oui
02 – Non PASSEZ À Q.19
99 – NSP/SO PASSEZ À Q.19

18a. Quels types de mesures avez-vous prises?
NE LISEZ PAS – NOTEZ TOUTES LES RÉPONSES APPLICABLES

01 – Tests et mesures de la qualité de l'air
02 – Mesures du CO_2
03 – Mesures des matières particulaires/de la poussière
04 – Mesures de l'humidité
05 – Questionnaires
98 - Autre (PRÉCISEZ)_____
99 – NSP/SO

Purificateurs d'air portatif

19. Avant que vous ne répondiez à ce sondage, aviez-vous entendu parler des purificateurs d'air portatifs?

    01 – Oui
    02 – Non PASSEZ À Q.27
    99 – NSP/SO PASSEZ À Q.27

20. Est-ce que votre immeuble est équipé de purificateurs d'air portatifs?

    01 – Oui
    02 – Non PASSEZ À Q.27
    99 – NSP/SO PASSEZ À Q.27

21. Si vous participiez au choix d'un purificateur d'air portatif, quels facteurs influenceraient votre choix d'un modèle en particulier?
    NE LISEZ PAS – NOTEZ TOUTES LES RÉPONSES APPLICABLES

    01 – Coût
    02 – Efficacité
    03 – Parfait pour cette tâche
    04 – Compatible avec d'autres systèmes
    05 – On me l'a recommandé
    06 – Selon le système de classification de l'industrie
    07 – Efficacité énergétique
    08 – Facile à entretenir
    09 – Peu bruyant
    10 – Facile à utiliser
    11 – Service à la clientèle
    12 – Réputation
    98 - Autre (PRÉCISEZ)_____
    97 – Je ne participe pas au processus décisionnel
    99 – NSP/SO

22. Avez-vous déjà entendu parler du système de classification des purificateurs d'air portatifs?

    01 – Oui
    02 – Non
    99 – NSP/SO

23. Quel pourcentage des occupants de votre immeuble utilisent des purificateurs d'air portatifs?
    LISEZ SEULEMENT SI CLARIFICATIONS NÉCESSAIRES

    01 – 0-10 %
    02 – 11-20 %
    03 – 21-30 %
    04 – 31-40 %
    05 – 41-50 %
    06 – 51-60 %
    07 – 61-70 %
    08 – 71-80 %
    09 – 81-90 %
    10 – 91-100 %
    NON SUGGÉRÉ
    99 – NSP/SO

24a. Est-ce que des occupants de votre immeuble vous ont demandé si un purificateur d'air portatif les aiderait à régler un problème en particulier ou une préoccupation en lien avec la qualité de l'air intérieur?

01 – Oui
02 – Non PASSEZ À Q.25
99 – NSP/SO PASSEZ À Q.25

24b. Quel type de problème les préoccupait et les a motivés à vous poser des questions au sujet des purificateurs d'air portatifs?

01 – INSCRIVEZ MOT POUR MOT
99 – NSP/SO

25. Quels changements positifs en lien avec la qualité de l'air intérieur avez-vous remarqués depuis qu'un purificateur d'air est en fonction?
NE LISEZ PAS – NOTEZ TOUTES LES RÉPONSES APPLICABLES

01 – Les résultats des tests sur la qualité de l'air
02 – Les occupants font moins de plaintes
03 – Les occupants ont moins de problèmes de santé
04 – Meilleure qualité de l'air intérieur
05 – L'air est plus frais
06 – Aucune diminution de la qualité de l'air
98 - Autre (PRÉCISEZ)_____
97 – Je n'ai vu aucun changement
99 – NSP/SO

26. Avez-vous mesuré la qualité de l'air afin de noter les changements apportés depuis l'installation d'un purificateur d'air portatif?

01 – Oui
02 – Non PASSEZ À LA SECTION SUIVANTE
99 – NSP/SO PASSEZ À LA SECTION SUIVANTE

26a. Quels types de mesures avez-vous prises?
NE LISEZ PAS – NOTEZ TOUTES LES RÉPONSES APPLICABLES

01 – Tests et mesures de la qualité de l'air
02 – Mesures du CO_2
03 – Mesures des matières particulaires/de la poussière
04 – Mesures de l'humidité
05 – Questionnaires
98 - Autre (PRÉCISEZ)_____
99 – NSP/SO

Ventilateur-récupérateur de chaleur

S'IL A UN VRC (CODE 3 À Q.10), DITES : Vous avez mentionné plus tôt que votre immeuble possède un ventilateur-récupérateur de chaleur. PUIS PASSEZ À Q.29.

S'IL A DÉJÀ PRÉCISÉ QU'IL N'A PAS DE VRC (CODE 3 À Q.11), PASSEZ À Q.32

SINON, POSEZ Q.27

27. Avant de répondre à ce sondage, aviez-vous entendu parler des ventilateurs-récupérateurs de chaleur?

    01 – Oui
    02 – Non PASSEZ À Q.32
    99 – NSP/SO PASSEZ À Q.32

28. Est-ce que votre immeuble est équipé d'un ventilateur-récupérateur de chaleur?

    01 – Oui
    02 – Non PASSEZ À Q.32
    99 – NSP/SO PASSEZ À Q.32

29. Pour quelles raisons a-t-on installé un ventilateur-récupérateur de chaleur?

    01 – INSCRIVEZ MOT POUR MOT
    97 – Il a toujours fait partie de l'immeuble PASSEZ À Q.32
    99 – NSP/SO

30. Si vous participiez au choix d'un ventilateur-récupérateur de chaleur, quels facteurs influenceraient votre choix d'un modèle en particulier?
    NE LISEZ PAS – NOTEZ TOUTES LES RÉPONSES APPLICABLES

    01 – Coût
    02 – Efficacité
    03 – Parfait pour cette tâche
    04 – Compatible avec d'autres systèmes
    05 – On me l'a recommandé
    06 – Selon le système de classification de l'industrie
    07 – Efficacité énergétique
    08 – Facile à entretenir
    09 – Peu bruyant
    10 – Facile à utiliser
    11 – Service à la clientèle
    12 – Réputation
    98 - Autre (PRÉCISEZ)_____
    96 – Il a toujours fait partie de l'immeuble PASSEZ À Q.32
    97 – Je ne participe pas au processus décisionnel
    99 – NSP/SO

31. Quels changements positifs en lien avec la qualité de l'air intérieur avez-vous remarqués depuis qu'un ventilateur-récupérateur de chaleur est en fonction?
NE LISEZ PAS – NOTEZ TOUTES LES RÉPONSES APPLICABLES

01 – Les résultats des tests sur la qualité de l'air
02 – Les occupants font moins de plaintes
03 – Les occupants ont moins de problèmes de santé
04 – Meilleure qualité de l'air intérieur
05 – L'air est plus frais
06 – Aucune diminution de la qualité de l'air
98 - Autre (PRÉCISEZ)_____
97 – Je n'ai vu aucun changement
99 – NSP/SO

31a. Avez-vous mesuré la qualité de l'air afin de noter les changements apportés depuis l'installation d'un ventilateur-récupérateur de chaleur?

01 – Oui
02 – Non PASSEZ À Q.32
99 – NSP/SO PASSEZ À Q.32

31b. Quels types de mesures avez-vous prises?
NE LISEZ PAS – NOTEZ TOUTES LES RÉPONSES APPLICABLES

01 – Tests et mesures de la qualité de l'air
02 – Mesures du CO_2
03 – Mesures des matières particulaires/de la poussière
04 – Mesures de l'humidité
05 – Questionnaires
98 - Autre (PRÉCISEZ)_____
99 – NSP/SO

Nettoyage des conduits d'air

32. Avant de répondre à ce sondage, aviez-vous entendu parler du nettoyage des conduits d'air?

    01 – Oui
    02 – Non PASSEZ À Q.40
    99 – NSP/SO PASSEZ À Q.40

33. Savez-vous que les conduits d'air peuvent être contaminés?

    01 – Oui
    02 – Non PASSEZ À Q.40
    99 – NSP/SO PASSEZ À Q.40

34. Est-ce que les conduits d'air de votre immeuble ont déjà été nettoyés?

    01 – Oui
    02 – Non PASSEZ À Q.40
    99 – NSP/SO PASSEZ À Q.40

35. À quelle fréquence les conduits d'air sont-ils nettoyés?
    LISEZ ET NOTEZ UNE SEULE RÉPONSE

    01 – Tous les mois
    02 – Tous les deux mois
    03 – Tous les trois mois
    04 – Tous les six mois
    05 – Tous les ans
    06 – Tous les deux ans
    07 – Moins souvent
    NON SUGGÉRÉ
    98 – Ça dépend
    99 – NSP/SO

36. Si vous participiez au choix d'une entreprise ou d'un produit destiné au nettoyage des conduits d'air, quels facteurs influenceraient votre choix d'une entreprise ou d'un produit en particulier?
    NE LISEZ PAS LA LISTE – NOTEZ TOUTES LES RÉPONSES APPLICABLES

    01 – Coût
    02 – Efficacité
    03 – Parfait pour cette tâche
    04 – Compatible avec d'autres systèmes
    05 – On me l'a recommandé
    06 – Selon le système de classification de l'industrie
    07 – Efficacité énergétique
    08 – Facile à entretenir
    09 – Peu bruyant
    10 – Facile à utiliser
    11 – Service à la clientèle
    12 – Réputation
    98 - Autre (PRÉCISEZ)_____
    97 – Je ne participe pas au processus décisionnel
    99 – NSP/SO

37. Quels changements positifs en lien avec la qualité de l'air intérieur avez-vous remarqués depuis que vous nettoyez les conduits d'air?
NE LISEZ PAS – NOTEZ TOUTES LES RÉPONSES APPLICABLES

01 – Les résultats des tests sur la qualité de l'air
02 – Les occupants font moins de plaintes
03 – Les occupants ont moins de problèmes de santé
04 – Meilleure qualité de l'air intérieur
05 – L'air est plus frais
06 – Aucune diminution de la qualité de l'air
98 - Autre (PRÉCISEZ)_____
97 – Je n'ai vu aucun changement
99 – NSP/SO

38. Avez-vous mesuré la qualité de l'air avant et après le nettoyage des conduits d'air afin de noter les changements apportés?
01 – Oui
02 – Non PASSEZ À Q.40
99 – NSP/SO PASSEZ À Q.40

39. Quels types de mesures avez-vous prises?
NE LISEZ PAS – NOTEZ TOUTES LES RÉPONSES APPLICABLES

01 – Tests et mesures de la qualité de l'air
02 – Mesures du CO_2
03 – Mesures des matières particulaires/de la poussière
04 – Mesures de l'humidité
05 – Questionnaires
98 - Autre (PRÉCISEZ)_____
99 – NSP/SO

Passons maintenant à un autre sujet...

40. Qui s'assure de la bonne qualité de l'air intérieur de votre immeuble?
NE LISEZ PAS – NOTEZ TOUTES LES RÉPONSES APPLICABLES
EXPLOREZ : Y a-t-il quelqu'un d'autre?

01 – Administrateur des installations
02 – Gérant de l'immeuble
03 – Gestionnaire immobilier
04 – Une firme d'entrepreneurs
05 – Concierge
06 – Entrepreneur CVCA
07 – Les occupants
08 – Propriétaire de l'immeuble
09 – Hygiène et sécurité du travail
10 – Technicien d'immeuble
11 – Service des bâtiments et de l'entretien
98 - Autre (PRÉCISEZ)_____
99 – NSP/SO

Informations au sujet de la qualité de l'air intérieur

41. Est-ce que vous fournissez des conseils aux occupants ou aux organisations de votre immeuble en ce qui concerne la qualité de l'air intérieur?

    01 – Oui
    02 – Non
    99 – NSP/SO

42. DELETED

43. Lorsque vous voulez obtenir plus d'informations au sujet de la qualité de l'air intérieur, vers qui ou vers quelles organisations vous tournez-vous?
    NE LISEZ PAS – NOTEZ TOUTES LES RÉPONSES APPLICABLES

    01 – ASHRAE (*prononcé Ash-ray*)
    02 – Conseiller en matière de qualité de l'air
    03 – Fabricant
    04 – Fournisseur, entrepreneur, personnes travaillant dans le domaine du CVCA
    05 – Code national du bâtiment
    98 - Autre (PRÉCISEZ)_____
    99 – NSP/SO

Caractéristiques de l'immeuble

Finalement, j'aimerais vous poser quelques questions au sujet de votre immeuble. Les réponses nous permettront d'analyser les résultats de ce sondage.

A. En quelle année votre immeuble a-t-il été construit?

___ ___ ___ ___
99-NSP/SO

B. Quelle est la taille de votre immeuble en pieds carrés?
ACCEPTEZ UNE ESTIMATION, MAIS PAS UNE FOURCHETTE

___ ___ ___ mille pieds carrés
99- NSP/SO

C. Environ combien de différentes organisations se trouvent dans votre immeuble? Diriez-vous qu'il y en a…?
LISEZ. ARRÊTEZ LORSQUE VOUS ATTEIGNEZ LA BONNE CATÉGORIE.

01 – Une
02 – 2 à 5
03 – 6 à 10
04 – 11 à 20
05 – 21 ou plus
NON SUGGÉRÉ
99 – NSP/SO

D. Environ combien de personnes vivent ou travaillent dans votre immeuble? Diriez-vous qu'il y en a…?
LISEZ. ARRÊTEZ LORSQUE VOUS ATTEIGNEZ LA BONNE CATÉGORIE.

01 – Moins de 250
02 – 250 à moins de 500
03 – 500 à moins de 1 000
04 – 1 000 à moins de 2 000
05 – 2 000 à moins de 5 000
06 – 5 000 à moins de 10 000
07 – 10 000 ou plus
NON SUGGÉRÉ
99 – NSP/SO

E. Quels types d'installations se trouvent dans votre immeuble?
LISEZ SEULEMENT SI CLARIFICATIONS NÉCESSAIRES – NOTEZ TOUTES LES RÉPONSES APPLICABLES

01 – Cinémas et arts du spectacle
02 – Services d'alimentation/restaurants
03 – Bureaux
04 – Espaces pour la vente au détail
05 – Habitations
06 – Hôtel
07 – Installations scolaires/écoles
08 – Soins de santé (cliniques, services médicaux)
09 – Industrie légère (y compris les services de technologie de l'information)
10 – Gouvernement

NON SUGGÉRÉ
98 - Autre (PRÉCISEZ)_____
99 – NSP/SO

F. Est-ce que votre immeuble a été qualifié d'écologique?

01 – Oui
02 – Non
99 – NSP/SO

Voici ce qui termine le sondage. Au nom du Comité canadien sur la qualité de l'air intérieur et les bâtiments, nous vous remercions grandement de votre participation.

SI LE RÉPONDANT DEMANDE DES INFORMATIONS AU SUJET DE CE SONDAGE : Vous pouvez obtenir de plus amples informations au sujet de ce sondage en communiquant avec Luc St-Martin du Conseil national de recherches au 613-993-7844.

INSCRIRE DE L'ÉCHANTILLON :

G. VILLE

H. PROVINCE/TERRITOIRE