

mc² | a case study



the project

Located at Marine Drive and Cambie Street, MC² is an architecturally significant arrival point between Richmond and Vancouver. Its two towers and attached podiums include 554 residential and rental homes (405,000 sf.) along with 10,000 sf of retail units.

Built to a LEED® environmental standard, the development is a sustainable project that encourages the use of transit, walking, biking and co-op cars, all aimed at reducing the reliance on the automobile. A green roof and passive design features improve its environmental performance, while courtyards and gardens allow residents to connect with nature. Other amenities include a greenhouse, reflecting pond, fitness centre, meeting rooms, and public art by Douglas Coupland.

A collaboration between developer Intracorp, architect James Cheng and interior designer Scott Trepp, MC² was offered for sale in 2012 and sold out quickly. The project is slated for handover in early 2016.

“We’re always looking for better ways to build our homes and when we see something innovative and unique we want to look at it. MC² uses atmospheric energy for heating, cooling and domestic hot water, it uses less energy, at less cost, with a higher overall performance and it has a very low carbon footprint – it’s the perfect option for moving forward in the context of climate change”

DON FORSGREN, PRESIDENT AND CEO, INTRACORP



A better energy solution

MC² is the first major North American residential development to use atmospheric energy to provide both heating and cooling and drive down energy consumption through the application of personal metering.

“We focus on bringing innovation to the marketplace” says Don Forsgren, Intracorp’s President and CEO. “With the move to hydronic HVAC systems we are constantly looking for solutions that work for stand alone buildings and for those within District Energy precincts”.

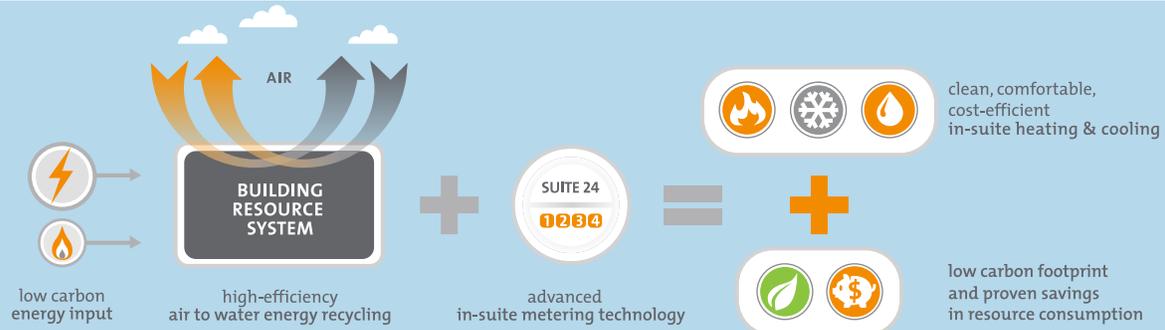
At MC² this research led the team to the AERMEC and Jaga products – at the heart of the smart**forme**® program. This technology is the foundation of European hydronic systems and has been used for decades but is relatively new here in the North American marketplace. The Intracorp team were impressed by their visit to the European manufacturers.

“The integrated system is extremely efficient and has a very low carbon footprint – and coupled with in-suite metering the program conserves energy and provides greater comfort to the homeowner. And its responsive to Municipal environmental commitments. We have been building concrete buildings for decades, however when we find a better way we are prepared to embrace the technology and the smart**forme**® solution gives us that edge”.

the smartforme^o energy program

The smartforme^o energy program allows developers to install a highly-efficient energy system with leading edge consumer benefits through an innovative combination of technology and financing. The program consists of four key elements:

- Energy from the atmosphere: AERMEC air-source heating and cooling, with integrated domestic hot water pre-heating and waste heat recovery;
- In-suite heating and cooling: customized Jaga dynamic radiators that provide architectural flexibility and outstanding homeowner comfort;
- Individual suite metering and billing: in-suite metering allows residents to pay only for the energy they use, reducing utility costs and strata fees;
- Program financing: individual metering facilitates capital investment within an industry standard energy rate structure



smartforme^o is delivered through a partnership between equipment supplier Olympic International and energy management provider Enerpro Systems, working collaboratively with developers and municipalities.

elegant technology

“The Europeans are literally a couple of decades ahead on this type of air-source technology,” says Peter MacLellan, Sales Engineer with Olympic International. “It’s tried and true with a long track record and it’s a more elegant solution than our usual HVAC offering.”

sophisticated metering

“Metering the amount of heating, cooling and hot water used by homeowners’ significantly reduces their energy consumption,” says Steven Roka, Vice President and Director of Enerpro Systems.

“Not only does this system bring down energy costs; it puts people in charge of what they use and what they pay for.”

innovative financing

“It made sense to combine the European energy generation and distribution technology with Enerpro’s metering programs,” says Roger Bayley, Program Director for smartforme^o. “By doing so we created a financial relationship between the mechanical capital cost on a project and operational cost for the consumer. smartforme^o helps developers implement leading-edge technology in a way that makes financial sense.”

the smart**forme**[°] development experience

Architecture

Architecturally, the smart**forme**[°] energy program allows creativity and flexibility.

Jaga radiators are integrated with low-noise fans, so they don't require bulkheads or dropped ceilings to accommodate ductwork. "Some systems really limit how you can furnish a room," says James Cheng, MC²'s architect. "This system can run along the window, freeing up the rest of the wall. Having no bulkhead simplifies the ceiling, and that translates into economy for the developer. For a project that has views, you can add another eight to ten inches of sky, which is terrific! It expands the room; it makes the inside-outside relationship a lot stronger."

Avoiding bulkheads allows the developer the choice of offering higher ceilings or potentially adding another floor to the project. And no floor space inside the suite is lost to the HVAC system, as happens with in-suite heat pump and fan coil systems.



"A big thing for the development and architectural communities is flexibility. We're a large company but we can take a product, customize it and make it fit their project. For MC² we met first with the engineers to make sure we could meet the required capacity. Then we customized the grilles and offered different colors to make sure the architects had a look they liked. Finally, we worked with the general contractor and mechanical contractor to make sure the installation process worked for them."

CYRUS KANGARLOO, JAGA CANADA

Mechanical

The combination of Italian-manufactured AERMEC air-to-water heat pumps and Belgian Jaga radiators used at MC² offered both efficiencies and challenges for mechanical designers and installers.

“The AERMEC system is a packaged approach, with heating and cooling, waste heat recovery, and domestic water pre-heat,” comments Peter MacLellan of Olympic International. “It’s easier to organize ahead of time, more of the components come in one box, and in the long run it’s simpler for the end user to own and service the equipment.”

“MC² is very maintenance-friendly,” says Jubin Jalili, Mechanical Engineer of Record for the Integral Group, the project’s mechanical consultant. “All the incoming heating and chilled water lines are inside manifolds in the suite in an accessible area like the laundry or bedroom closets. It makes maintenance easier.”

“The technology being used on MC² is not new; it’s tested, it’s great technology, and it’s been in use for a long time in Europe. This project is a huge step forward in implementing a technology that’s innovative for North America on a large scale, proving that it makes sense from an economical and energy point of view. This approach is a win for everyone!”

GORAN OSTOJIC, VICE PRESIDENT, WESTERN CANADA, INTEGRAL GROUP

“From an installer’s point of view, there is extra pipework involved in the installation, connecting these pipes back to a central energy center”, says Allan Higgins of DMS Mechanical. “The jobs that go well, are the ones where the engineers and the architects are in communication. As time goes on, it’s getting easier to apply new technologies used in hydronic systems.”

Says Tom Hickman of Axiom Builders, MC²’s general contractor: “In projects like this, you need a close relationship between the mechanical engineer and the architects to ensure that both of their needs are met”.

Jubin Jalili agrees. “I wouldn’t say it was hard, but it really needed an integrated design approach. For example, there are heating units installed in the window sill. This needed detailed coordination with the architect to make sure that the units fit and the details are aesthetically pleasing.”



“MC²’s use of European heat pumps, European fan coils was something new in this market, especially coupled with the individual suite metering. It’s pushing the boundaries, and establishing something that can be used in other developments. Ever since we’ve been specifying Jaga units, we’re getting asked to do tours for people. Now we’re seeing them used even by developers that were only comfortable with traditional systems in the past.”

JUBIN JALILI, PRINCIPAL, INTEGRAL GROUP

Key consumer marketing points for the smart**forme** energy program:

- responsive in-suite cooling
- zone temperature control
- quiet, aesthetically pleasing technology
- low maintenance
- ceiling height
- pay for only the energy you use
- low CO₂ emissions, “green”
- energy conservation



the smart**forme**° development experience

Sales and Marketing – consumer benefits

“MC² sold extremely well, and the energy system contributed to its success,” says Tracie McTavish of Rennie Marketing Systems. Tracie’s team pointed out the Jaga units in the showhome, and followed up with any buyers who wanted additional detail.

“The consumer doesn’t get into the technicalities too much, but they want cooling – that’s a big attribute to the buying process. They also always gravitate toward ceiling height – even a few inches extra is a real benefit,” says Tracie. “And while consumers won’t pay extra for “green,” they do love it. If you offer two identical buildings, same price and location, they’ll buy green every time.”

“Cooling is really important,” says James Cheng. “MC² is located on two major roads, with the train out front contributing to noise and dust. If you don’t want to open your window, it’s important to be able to cool your suite.”

“It’s a win, win, win. The total cost to the home owner in the building is less. It reduces green-house gases and is good for the environment. And there’s a big upside for developers: they don’t pay for the meters, they get LEED points, they have more marketable buildings with lower strata fees. It’s a big positive for the environment – at no cost.”

STEVE ROKA, VICE PRESIDENT AND DIRECTOR, ENERPRO SYSTEMS

Intracorp explained the cooling feature on this project to buyers as “passive cooling” – able to keep the suite bedrooms at a comfortable temperature. “We’re careful not to say air conditioning,” says Don Forsgren. “There are developments that offer AC, but typically they have to charge more; it’s expensive. This provides comfort, plus it’s cost-effective.”



“We really want to encourage leadership and innovation. Showcasing solutions is important, because in order to transform to a world-class level leading in energy efficiency and low carbon, the broader industry needs to see that there are some great tools out there – whether it’s unit sub-metering or triple pane windows. We’re not telling people how to do it, we’re just setting the performance outcomes. There’s still design flexibility and choice even as they meet our continually increasing requirements.”

SEAN PANDER, GREEN BUILDING MANAGER, CITY OF VANCOUVER

MC²'s cooling has superior responsiveness, says Cyrus Kangarloo of Jaga, “the integrated fan system, takes just minutes to feel comfortable.” Multiple radiators in each suite also allow individual temperature control in each room.

Another selling point with the Jaga system is that its fans – similar to the fan inside a computer – are virtually noise-free. “By comparison, the compressors in small-scale in-suite heat pumps are noisy,” says Roger Bayley of smartforme°. “Plus the homeowner has to change the filters, not something new home owners or tenants may be aware of.”

The ability to meter energy use in individual suites addressed one of the challenges developers face in the condo market, says Don Forsgren of Intracorp. “Most condos charge suite owners a flat rate for energy. There’s a perceived unfairness there, if someone is away for six months and the person next door has the windows open all winter – they get charged the same.

“With individual metering the end user pays for what they use. That means strata fees are less, even though the burden of payment for this system is on the user. After the system is paid off, the strata can reduce energy costs to unit owners if it chooses.” It’s estimated MC² owners will pay about half the energy price that others in the same neighborhood will be paying in 15 years’ time.



looking to the future



Those involved in MC² agree that its innovative energy system points the way to a better future, for developers, home buyers and the environment.

“This system offers an extraordinary step in terms of conservation, carbon reduction, and cost,” says Roger Bayley. “About 60-65% of the energy in this project is coming from a zero-carbon source. You put in a kilowatt hour of electricity and you’re getting approximately 3.5 kilowatts of thermal energy - essentially 2.5 kilowatts for free. There’s an inexhaustible supply of atmospheric energy out there; we could get 60% of all energy needs in every new high-rise building from the atmosphere at marginal cost. Why not use the resource that’s sitting there in front of us?”

“What we did with this project, is created the ability for owners to have greater control of the future,” says Goran Ostojic. “Change is happening, and you can’t stop it. But this is ‘future-proofing’ – it’s carbon neutral, energy efficient, it has cooling, it gives better control of individual costs, and fits into City of Vancouver’s emission goals. smartforme^o offers developers a way to make green buildings the standard instead of the exception, and creates enthusiasm in the market.”

“We’re creating a new collaborative way to build a better building, with innovative new technology that benefits everyone,” says Mike Mahannah of Olympic International. “Sometimes it’s not an easy game to play because all we hear is, ‘Is it cheap?’ But it’s not the same old same old approach, it’s a collaborative approach - a better, greener building, more comfortable, more aesthetically pleasing, and still profitable for the developer. We’ve figured out a way to have everyone win!”

smartforme^o – turning energy into opportunity

smartforme^o

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THE CITY OF VANCOUVER HAS ADOPTED A TARGET TO HAVE ALL NEW BUILDINGS CARBON NEUTRAL IN THEIR OPERATIONS FROM 2020 ONWARD AND TO SHIFT TO 100% RENEWABLE ENERGY BY 2050. USING ENERGY EFFICIENT TECHNOLOGY, ADOPTING LESS CARBON INTENSIVE SYSTEMS, AND ENCOURAGING DEVELOPERS TO CONSIDER WAYS TO IMPROVE OCCUPANTS’ ENERGY USAGE BEHAVIORS ARE ALL PART OF THIS DISCUSSION.

