

# TALK



# transformation!



## Buildings and Energy in a Low-Carbon Toronto

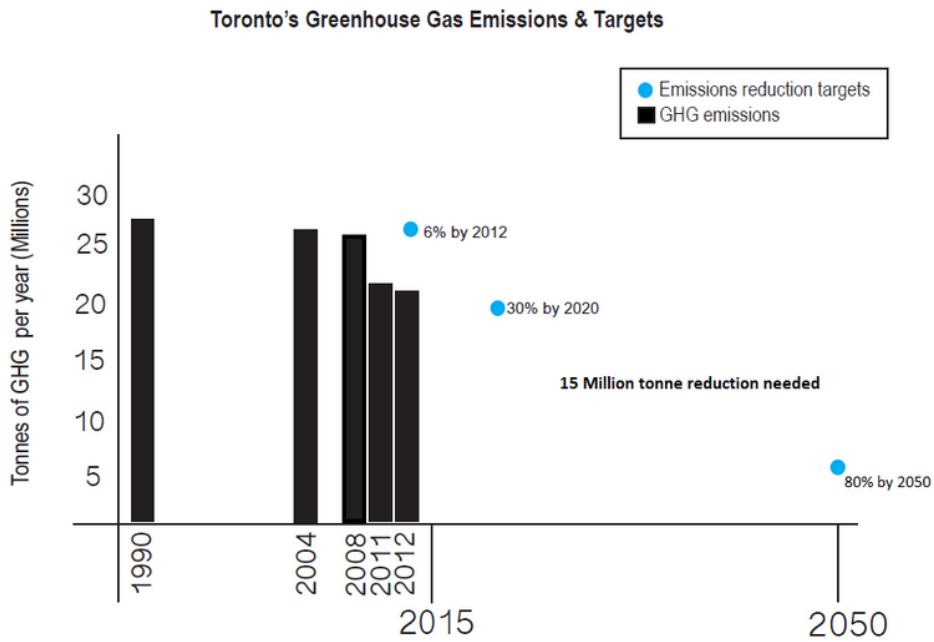
What does the community  
have to say?

Summary of workbook ideas



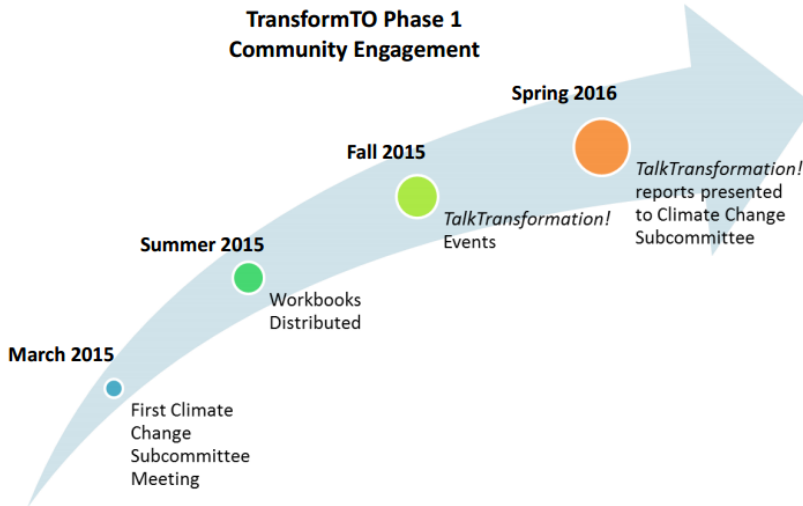
## Background

Toronto has established a goal of reducing greenhouse gas emissions by 80% by 2050 to support its vision of being one of the most sustainable and resilient cities in the world.



### **TransformTO is an initiative that will help us achieve this goal**

Building on the success of the City's plans and strategies, including the Climate Change Action Plan (2007), and the Power to Live Green (2009) TransformTO: Climate Action for a Healthy, Equitable and Prosperous Toronto will encourage collaboration and dialogue between City divisions, community members, experts and other stakeholders to chart our path to a sustainable future.



As a part of the community engagement focus of TransformTO, the City will host a series of TalkTransformation! events throughout the fall 2015 and winter 2016.

**Each TalkTransformation! events will focus on a particular topic:**

- Resilience and Adaptation to Extreme Weather
- Low-Carbon Mobility and Transportation
- Green Spaces and Urban Agriculture
- Energy Systems and Buildings
- Sustainable Consumption and Behaviour
- Health and Climate Change

The objective of the series is to encourage community members and experts to share their best and brightest ideas and to generate dialogue that will help to inform the actions we will take to improve our resilience and sustainability.

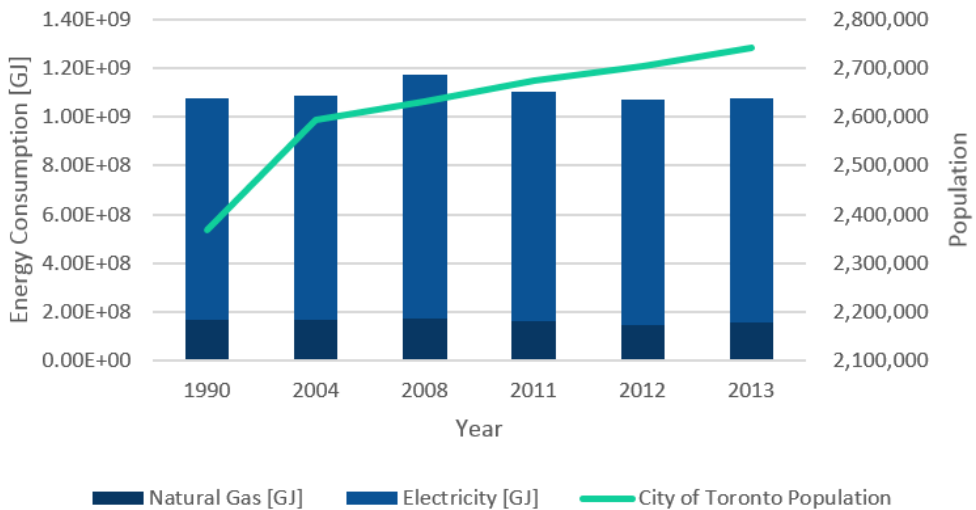
Residents are encouraged to share their ideas on each topic by completing the online TransformTO workbook. A summary of the comments are presented to the panelists before each event.

This workbook summary on the topic of Buildings and Energy Use, is based on the comments provided in 60 workbooks.

**The energy used to heat, cool and ventilate Toronto's buildings accounts for more than 40% of Toronto's greenhouse gas emissions.** Most buildings rely on natural gas and electricity to maintain comfortable temperatures throughout the year.

A number of City programs, including the Better Building Partnership, Tower Renewal, and Home Energy Loan Program, support the retrofit of older buildings, thereby reducing their energy use and GHG emissions. New commercial and residential development in the City of Toronto must comply with the energy efficiency requirements of the Toronto Green Standard.

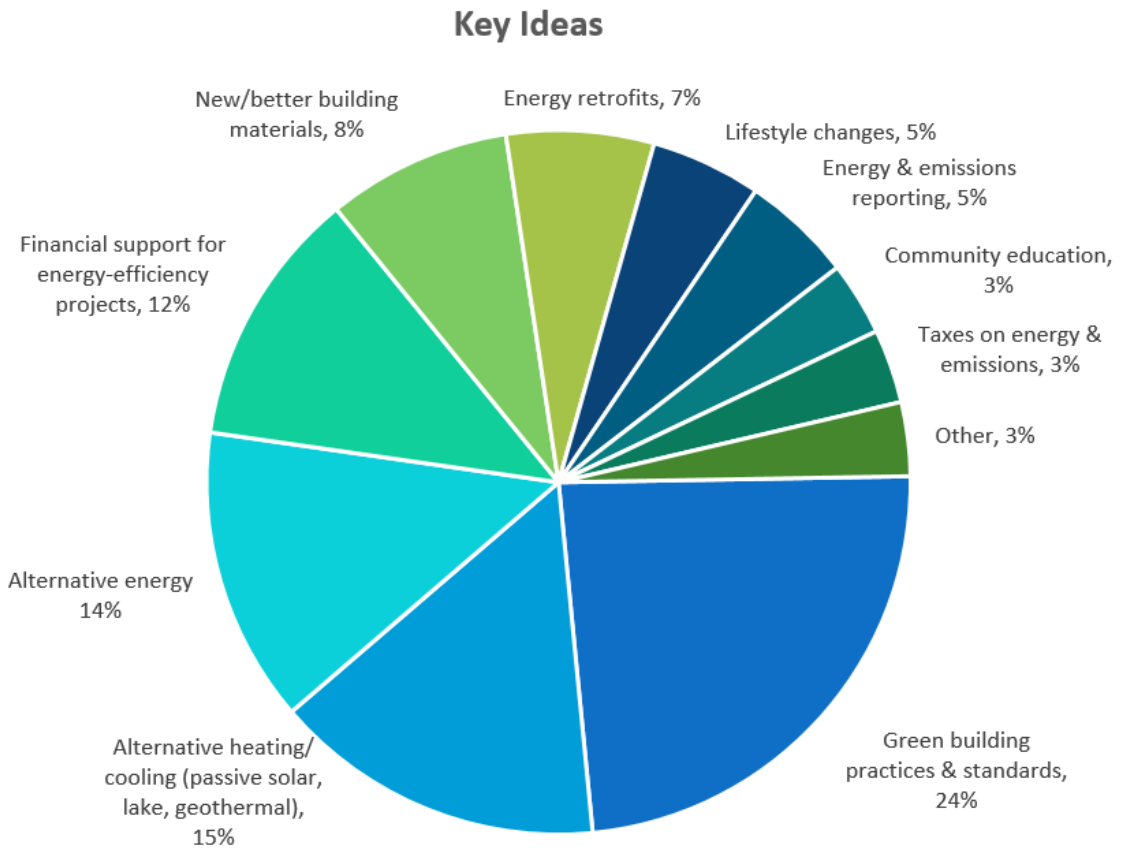
### Energy Consumption by Type in Toronto



## Summary of Community Ideas

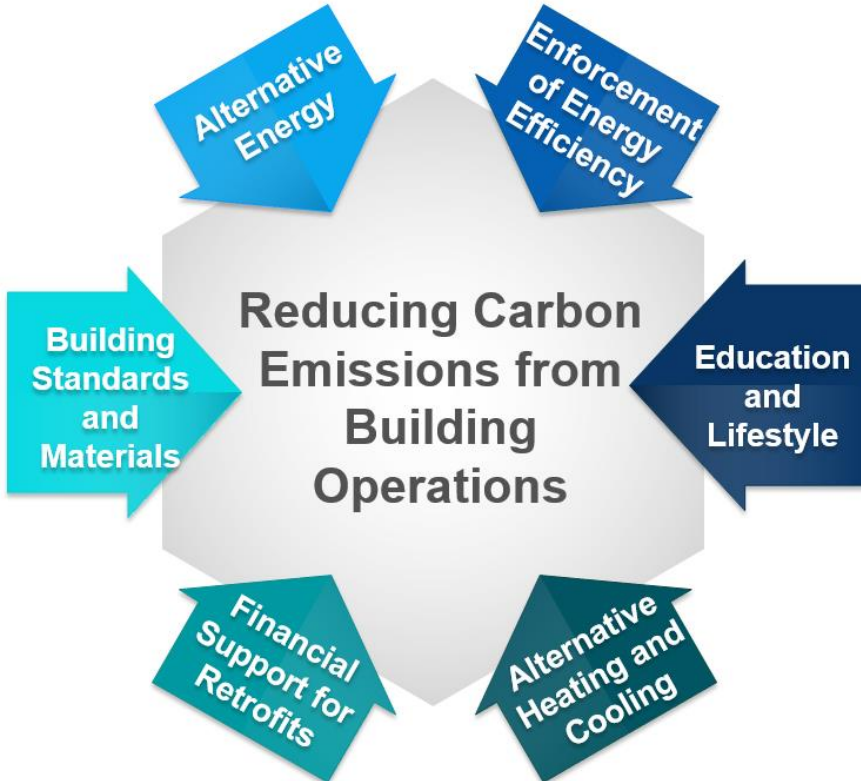
### 1.0 Ideas that will reduce carbon emissions related to building operations in Toronto.

What is the one idea you think has the most potential to reduce the carbon emissions related to building operations – heating and cooling buildings - in Toronto?



The chart on the previous page categorizes the responses of 60 workbooks into 12 topics. Many respondents spoke to the need for green building practices and standards (24%); sustainable building materials (8%); grants, loans and subsidies for energy efficiency projects (retrofits, alternative energy systems etc.) (12%). Respondents also provided ideas that focused on alternative energy such as solar and wind (14%); as well as alternative heating and cooling (geothermal, lake cooling, passive solar) (15%). Other ideas included social factors, such as lifestyle changes (5%) and community education (3%); and stronger enforcement of energy efficiency through taxes (3%) and official reporting requirements (5%).

**In general, the community ideas focused on six different strategies...**

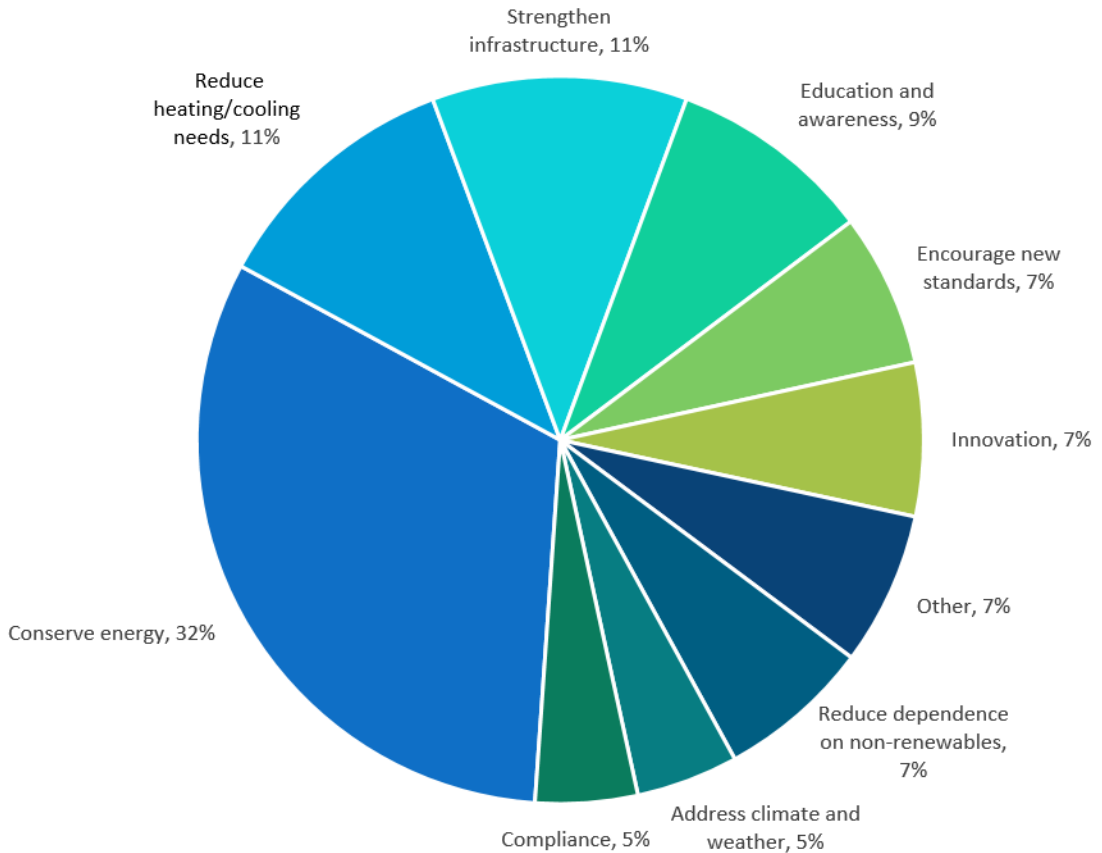


## 2.0 Areas of focus for emission reduction in buildings

Respondents were asked to elaborate on their initial idea by explaining how it connects to the larger topic of greenhouse gas emissions.

How will this idea reduce the greenhouse gas emissions of Toronto's buildings?

### Areas of Focus for Emission Reduction from Buildings



Community responses suggest that emissions from building operations can be largely addressed by conserving energy (32%) and the overall reduction of indoor heating and cooling needs through retrofits (11%). In addition, respondents suggest that we should focus on strengthening our existing energy infrastructure, specifically the electrical grid (11%); promote energy efficiency through community education (10%); and encourage new standards (7%) and innovation (7%).

**Overall, greenhouse gases from building emissions will be reduced if we...**





### 3.0 Examples of projects or programs that help reduce emissions from buildings' energy use

Community members were asked to provide examples of programs and projects that address the emissions and energy use associated with building operations. Respondents highlighted a number of successful local and international projects, programs and regulations. The following list highlights 9 examples, selected from the overall responses.

#### 3.1 Geothermal heating and cooling

Geothermal heating/ cooling systems are an alternative form of energy generation. A geothermal system typically exchanges heat with the ground through a system of underground pipes. The energy conserved through this exchange can contribute to the reduction of greenhouse gas emissions from the building.

There are many examples of residential and commercial geothermal projects in Toronto. The Press building at the CNE, for example, underwent retrofits in 2008 to help meet the City's overall goal of reducing emissions. A geothermal heating system was installed to address the building's heating and cooling needs.



### 3.2 Solar photovoltaic systems, City of Toronto

Solar photovoltaic (PV) systems produce energy by converting sunlight into electricity. In 2012, the City of Toronto committed to install solar PV systems on all City-owned properties. To date, 16 rooftop systems are operating on City facilities, generating a total of 1437 mWh of energy each year.

The Province of Ontario Feed-In Tariff (FIT and microFIT) programs support the installation of solar photovoltaic systems by providing homeowners and business owners with an opportunity to generate revenue by generating electricity from renewable sources. As of 2013, there were 505 microFIT and 105 FIT projects installed in the city, totalling over 20 MW of generation.

To learn more, visit the [Ontario Power Authority](#) web page.



### 3.3 Wind energy in the UK

Wind power is produced by converting energy from rotating wind turbines into electricity. Some areas of the world are better suited for wind energy generation. The United Kingdom, for example, produces a significant portion of its energy via wind power generation. More than 6,500 wind turbines in the UK produce over 33,000,000 MWh.

To find out more about UK's wind power, visit the [Renewable UK web page](#).



### 3.4 Green building certification

In addition to demonstrating a building owner's commitment to green design and sustainability, certification programs encourage sustainability and innovation. In Canada, there are two main certification programs, BOMA BEST and LEED. Both programs use pre-set criteria to assess and grade a building on its environmental performance (energy use, waste minimization, green building materials etc.). Meeting BOMA and LEED standards encourages innovation and sustainability within the property management sector.

To learn more about BOMA BEST and LEED, visit [Natural Resources Canada](#).



### 3.5 Tower renewal in Toronto

The goal of the City's Tower Renewal program is to address the environmental, social and economic needs of the many older buildings, and their residents, across Toronto through retrofits and community planning. A part of the program, Hi-RIS (High-Rise Retrofit Improvement Support Program), provides property owners with financial support for energy and water efficiency retrofits in high-rise buildings. The program plans to retrofit more than 1,000 high-rise buildings in the city, thus greatly contributing to lowering emissions in the Toronto. Based on 2011 census, over 40% of Toronto residents live in high-rise apartment buildings.

Learn more about Toronto's [Tower Renewal Program](#).



### 3.6 California Green Building Code

In 2011, the State of California updated their Building Code with a new section focused on environmentally sustainable construction practices. The California Green Building Code (CALGreen) incorporates concepts like energy efficiency, water conservation, resource efficiency and sustainable building materials into the official code. CALGreen is first-of-its-kind in establishing minimum green standards for most construction projects. Enforcement of such standards can greatly contribute to greenhouse gas emission mitigation in urban centres.

The City of Toronto promotes similar green building standards through its Toronto Green Standard (TGS), a two-tiered system that requires all new construction to adhere to minimum sustainability criteria. Unlike CALGreen, the current standards do not enforce the use of specific material types.

Learn more about the [Toronto Green Standard](#).



### 3.7 Green Communities Act, Massachusetts

The State of Massachusetts passed Green Communities Act (GCA) in 2008 in an effort to focus on renewable energy and energy efficiency. The Act has been successful in encouraging energy efficiency and increasing investment into the renewables sector. In addition to its environmental benefits, the legislation is expected to create jobs in the alternative energy sector. The Act provides qualifying cities and towns with grants and loans toward energy efficiency projects.

Ontario's Green Energy Act (GEA) has been providing similar benefits to the province since 2009. GEA has encouraged the expansion of the renewables sector in Ontario and has made renewable projects more affordable with its Feed-In-Tariff program.

Learn more about the [State of Massachusetts Act](#) and Ontario's [Green Energy Act](#) online.



### 3.8 Algae façade in Hamburg, Germany

A residential building in Hamburg, Germany is making history by growing tiny-plants (algae) in its glass-exterior shell. The plants are then harvested and used to produce biogas fuel to heat the building. This innovative building is expected to be fully self-sufficient once the system reaches operational capacity. In addition to reducing the emissions associated with energy use, income can be generated through the sale of algae.

Visit the [project webpage](#).





### 3.9 SolarShares in Sacramento, California

Since not all housing types can support the installation of solar PV systems, Sacramento Municipal Utility District provides residents with an option to use solar energy without physically installing solar panels on their property. By buying solar shares, residents invest in solar energy generated at nearby solar farms. The participants benefit from a low-cost option and offset their utility bills with credits that they accumulate from their "share" of the solar power generation.

Learn more about SolarShares in the [Sacramento Municipal Utility District](#).



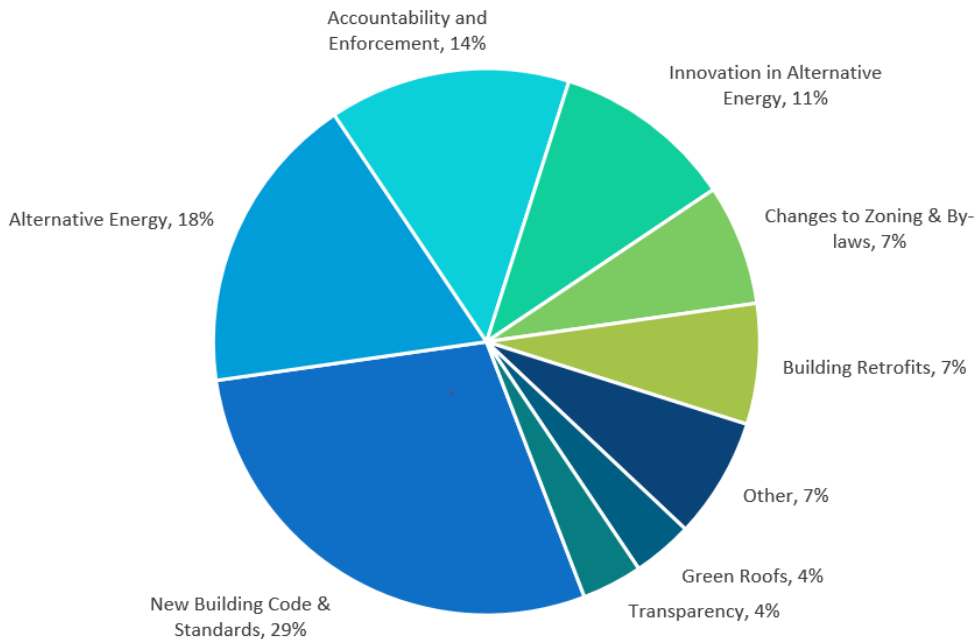
## 4.0 Community Comments

Community members were asked to share any additional ideas that they would like discussed at the TalkTransformation! – Buildings and Energy Use event.

What other ideas and questions would you like to hear discussed at the TalkTransformation! Energy & Buildings event?

Additional ideas largely focused on sustainable building standards (29%) and their enforcement (14%). Respondents also requested discussions that focused on supporting alternative energy initiatives (18%); innovation in the renewables sector (11%); zoning and by-law changes that would allow innovation and new green standards (7%); and building retrofit programs (7%).

### Other Ideas on Reducing Building Emissions



**Examples of specific comments and questions:**

*"How and when we can switch to or include energy producing "green" solution? When it will be mandatory? When it will be affordable to produce energy by towers and homes?"*

"Little point in making more energy if it just goes out leaky windows and doors."

**"Put on a sweater in the winter!"**

"Mandatory bench marking and reporting of building efficiency across all building types in Toronto."

"I would like to hear about the options for retrofitting existing buildings. We cannot lose all of that stored energy by just demolishing them. Where is Toronto headed? What will the population be? What is the long term plan?"

[www.toronto.ca/TransformTO](http://www.toronto.ca/TransformTO)

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