



OnePoll Market Study

Sponsored by Autodesk

Sustainable Cities

Architecture, Engineering and Construction Report

Autodesk®

1. Introduction: Approach & Methodology

With rapid urbanisation and population increases impacting countries across the developed and developing worlds, town and city planners across the globe are having to come to terms with the growing requirement for massive infrastructure investment. They are also increasingly aware of a need to improve transportation, water, electric and gas distribution, and energy efficiency.

The term 'sustainable cities' is now a popular and widely-used term to describe this growing phenomenon, increasingly becoming part of the vocabulary used across the architecture, engineering and construction industry in Europe. Awareness and understanding is high across businesses and national borders. However, if the concept is to become a commercial reality, the next stage will need to be finding a consensus view on the issues that matter to the industry.

The *Sustainable Cities* research report, which was conducted by online research organisation, OnePoll, and sponsored by Autodesk, sought to capture the views and opinions of consumers across four leading European countries: France, Germany, Italy and the UK about a range of issues related to sustainable cities.

The survey which included business owners, representing around 25 per cent of the total survey sample, was carried out over a period of two weeks in late July and early August. The results of 2,000 respondents were collated and provided to Autodesk for analysis and interpretation. This report is the first output of that process.

2. Executive Summary

The research results reveal that a significant majority of business decision makers and consumers would be willing to invest to make their buildings and homes more energy efficient. 86 per cent of business decision-makers stated a willingness to invest to make their businesses more energy efficient while 70 per cent of consumers were prepared to spend money to make their homes greener. Of course, one key area where businesses can drive additional energy efficiencies is by making their buildings greener and more sustainable. Autodesk's sustainable design and analysis software solutions can play a key role in this context by enabling efficient green building design.

At the same time, the research, highlights differing views both about the challenges facing the sustainable development of cities and about the solutions to these problems. As such, it shows that there is an urgent need for greater education and awareness of the steps individuals and communities across Europe could take to drive the development of sustainable cities.

3. Study Conclusions

3.1 Company Owners Willing to Invest in Greener Businesses

The survey finds that a significant majority of both business decision-makers and consumers are willing to invest in sustainability.

86 per cent of owners, directors or senior decision-makers are happy to invest to make their businesses more energy efficient. The strength of this commitment is demonstrated by the fact that 27 per cent said they would be prepared to pay 10 per cent more, than what they were paying today - a significant commitment, particularly in light of the ongoing downturn. Italian businesses were particularly interested in investing money to become greener with as many as 39 per cent claiming they would be prepared to spend 10 per cent more. The comparable figure in the UK was just 14 per cent. The disparity reflects an increased focus from Italian companies over recent years in renewable energy and in driving energy efficiencies.

There a broad range of reasons for the strong Europe-wide focus on investing in energy efficiency. Businesses are beginning to get the message that investment now will ultimately make economic sense and be sure to lead to reduced energy bills in the future. Organisations also increasingly appreciate that by implementing measures to raise energy efficiency, they are likely to improve the image of their company with customers prospects and stakeholders as a reliable and trustworthy business to engage with.

The survey also finds a significant majority of European consumers (70 per cent) are prepared to invest to live in a 'green energy efficient home.' Italian consumers were the most willing to spend money on greener homes with 86 per cent stating a willingness to pay. UK respondents were least willing with 58 per cent saying they were happy to invest in more energy efficient homes..

The survey reveals that business owners understand the importance of making their organisations greener. Despite the downturn, they are prepared to invest to achieve this. Consumers, on the other hand, are becoming more aware of green issues but, wary of the economy, are deferring decisions on greener housing, so sustainable housing remains low on their priority list.

3.2 No Consensus on the Challenges Facing Sustainable Cities

The research demonstrates that there is no clear consensus on the key challenges facing the sustainable city today. When asked, which of the following they saw as the greatest future challenge to these cities, there was a gap of less than ten percentage points between the highest and lowest ranked responses.

Overall, the ranking was as follows: global trends like climate change (30 per cent); ageing populations (25 per cent); growing populations (24 per cent) and a shortage of water and other key resources (21 per cent).

Interestingly, 'growing populations' scored particularly highly in the UK with 43 per cent, much higher than in any other country. In Italy climate change was the top choice with 39 per cent, in France it was resource shortages with 32 per cent and in Germany it was ageing populations with 35 per cent. These results underline the huge diversity of views on this topic across the four different European countries and arguably highlight a degree of confusion with the nature of the threat.

Consumers were equally split over solutions. Buying locally to support local businesses and farmers was the most popular option, supported by 37 per cent of the sample, followed by increasing energy efficiency, 29 per cent, and planting trees in the local area by 19 per cent.

3.3 Focus on Emissions

In line with the growing EU focus on reducing greenhouse gas emissions, cutting CO₂ emission levels is seen as the most important next step that cities should take to make themselves greener and more sustainable.

In terms of challenges, slashing CO₂ emissions and creating energy efficient buildings were seen as key by many respondents across all territories surveyed. 31 per cent, and 28 per cent of respondents, respectively saw these as the most important next step that their city should take to make itself 'greener' and more sustainable.

Cutting CO₂ was the most popular option in every country apart from the UK, where it was beaten into third place by 'creating energy efficient buildings' and 'improving roads'.

In the UK, energy efficient buildings have achieved a higher profile, driven by the success of emerging technologies like rapid energy modelling as well as a growing focus on this issue from the UK government and across the civil service.

Interestingly, when asked to name the most pressing environmental concern that they had with their city's future, survey respondents only placed carbon emissions in third place. Overall, expensive electricity was seen as the most urgent concern, highlighted by 26 per cent of respondents. This was followed by traffic, referenced by just under 25 per cent and carbon emissions cited by 21 per cent.

3.4 Different Perspectives

One of the key themes highlighted in the research was the differences in focus between the views and opinions of the four different nationalities profiled – France, Germany, Italy and the UK. These differences were evident across most of the key survey questions.

In terms of businesses willingness to invest in making themselves more energy efficient, we have already seen that Italy and the UK were at opposite ends of the spectrum in this respect. In contrast, France and Germany had similar results with around 25 per cent of businesses in each country willing to pay 10 per cent more than would otherwise be the case.

Responses of individual consumers inevitably reflected national cultural or political focuses. Italian consumers typically tended to be focused on the drive for achieving energy efficiencies; in the UK, the survey highlights national preoccupations with buying locally; expensive electricity and energy efficient buildings.

There were stronger parallels in terms of the results of France and Germany. This has already been noted with respect to business owners and directors' willingness to make their companies' more energy efficient. The same also held true when consumers were asked how much extra on top of what they are spending today they would pay to live in a green 'energy efficient' home? Over 30 per cent in both France and Germany stated that they would only be interested if they could receive this as a free service. Equally, both countries joined the UK in asserting that they would be prepared to buy locally to make their city a more environmentally friendly place to live.

The data also revealed some stark differences depending on the age of the individual being surveyed. It could convincingly be argued that there are greater similarities between the views and opinions of young people across the four countries than between the young and old in the same country.

In every country surveyed as the age of the respondent rose, so did the likelihood of that person emphasising the importance of improving roads to minimise congestion, testament to the cumulative frustration of years spent commuting into city centres. In the UK, 40 per cent of over 60s cited this as 'the most important next step their city should take to make itself greener and more sustainable compared to just 11 per cent in the under 20 age range.

There was also a strong correlation between age and concern about carbon emissions as a pressing environmental. Young people, arguably more attuned to the current environmental agenda, were highly concerned about this issue, those over 40 far less so. In France, for example, only 13 per cent of over 60s were worried about this issue compared to 25 per cent of those aged under 20.

Other noteworthy correlations were a tendency for older people to be more cynical about the importance of climate change as a key challenge to sustainable cities. Again, the UK provides a good example of this with 41 per cent of under 20s worried compared to just 20 per cent of over 60s.

4. Question-by-question Analysis

4.1 Making Businesses more Energy Efficient

The first main survey question was targeted just at business owners, directors or senior decision makers. It asked them, "how much more than what they are spending today, would they be prepared to pay to make their business more energy efficient."

Overall, 86 per cent of respondents would be prepared to spend something to make their business more energy efficient. Italian businesses were far more willing than any other country to spend money on this, with 39 per cent saying they would be prepared to pay at least 10 per cent more than they were spending today. UK businesses were least willing - with just 14 per cent saying they would pay 10 per cent more.

The results highlight the widely held perception that UK firms often lag behind their peers in Europe in the sustainability stakes and that while they are often happy to talk about sustainability issues, they are often less willing to invest in strategies which make them more efficient as a business.

The positive results for Italy reflect a culture where energy efficiency is seen as a key priority. Over the past decade, the country has developed a strong growth of onshore wind, biogas and biodiesel. The expansion of wind energy has developed impressively in the last few years. Italy is now the world's sixth largest producer of wind power with a capacity of 3,736Mw in 2008 (source: European Wind Energy Association ([EWEA](#))).

4.2 Greener and More Sustainable Cities

Respondents were asked what in their view was the most important next step that their city should take to make itself 'greener' and more sustainable?

The full results were as follows:

- Slashing CO2 emissions by 20 per cent by 2020 31 per cent

- Creating energy efficient buildings 28 per cent
- Improving roads to minimise congestion 21 per cent
- Decreasing pollution in rivers, streams and waterways 16 per cent
- Increasing taxes on all energy use 4 per cent

The emphasis on CO₂ is perhaps unsurprising given the high media profile this issue has enjoyed over recent years. The issue tends to be high in the public consciousness also because of recent EU legislation to curb emission levels.

In the UK, energy efficient buildings have achieved a higher profile over recent months in particular, driven by the success of emerging technologies like rapid energy modelling as well as a growing focus on this issue from the UK government and across the civil service.

4.3 Energy Efficient Housing

The survey found that 70 per cent of respondents across Europe would be willing to pay extra to live in a green 'energy efficient' home – another positive affirmation of high levels of willingness to invest in sustainability. In country terms, Italians were by far the most receptive, with 39 per cent saying that they would pay 10 per cent more than they were paying currently (rising to 46 per cent among Italian men)

Again, the figures for France and Germany were roughly comparable – with over 30 per cent in each country saying that they would be interested if they could receive this as a free service.

Once again, respondents from the UK would be the least willing to spend money with just 11 per cent saying they would pay 10 per cent more. 42 per cent of UK respondents would only be interested in this service if it could be provided free of charge.

However, the UK government has been proactive in pushing the green housing agenda. In addition to making new homes carbon free, the Coalition also wants to improve the energy efficiency of existing property.

Interest levels in green housing decline with age, which reflects the popular perception that green issues have more resonance with the young.

Typically, willingness to spend more on energy efficient homes reflects the level of concern that individuals have about climate change and the desire to invest more in this kind of home reflects how worried the individuals concerned are about these key issues.

4.4 The Environmental Future of Cities

The survey questionnaire asked respondents for the most pressing environmental concern that they have with their city's future. Overall, expensive electricity was the most urgent concern, highlighted by 26 per cent of respondents. This was followed by traffic, referenced by just under 25 per cent and carbon emissions, 21 per cent.

Expensive electricity was the top choice in the UK, Germany and France, while in Italy it trailed in third below traffic and carbon emissions. French and German respondents both seemed less concerned than their UK and Italian counterparts about these issues with 11 per cent in each country, referencing 'none of the above.'

Reflecting current preoccupations, overpopulation was rated the least urgent issue overall with just 9 per cent referencing it. It is likely that 30 years ago, when it was a particularly hot topic among environmentalists, overpopulation would have topped this poll. Today, it has tended to be superseded in the public imagination by issues around climate change, CO₂ emissions and energy efficiency in general.

4.5 Making a City Environmentally Friendly

The survey sample were asked what they would be most prepared to do to make their city a more environmentally friendly place to live. They were given a list of four possible options to choose from.

Overall, the results were as follows:

- Buy locally to support local businesses and farmers 37 per cent
- Increase energy efficiency 29 per cent
- Plant trees in local area 19 per cent
- Change my mode of transport 15 per cent

Buying locally was particularly strongly supported in the UK market (referenced by 45 per cent of respondents). Interest in this option was stronger in the older age ranges and among women rather than men. It was also the most popular option in France and Germany. In Italy, increasing energy efficiency proved to be a more compelling option, supported by 40 per cent.

In the UK, in particular, there has been a growing awareness not just of the health gains people can achieve from buying locally but also of the wider environmental benefits. Typically, these include reductions in transportation time and the consumption of bio fuels and the fact that purchasing food

locally, at a farmers market, for example, typically helps preserve space that might otherwise be taken and used for commercial real estate purposes.

In Italy, the strong focus on renewable energy, highlighted earlier in this report, has undoubtedly contributed to the high score the country achieved for this key criterion.

4.6 Greatest Challenge to Sustainable Cities

The survey sample was asked to define what it saw as the greatest challenge to sustainable cities in the future?

Overall, the results were as follows:

- Global trends like climate change 30 per cent
- Ageing populations 25 per cent
- Growing populations 24 per cent
- Shortages of water and other key resources 21 per cent

This question produced a wide range of different views in every country surveyed. Just nine percentage points separated the top scoring answer from the bottom.

In Italy climate change was the top choice with 39 per cent, in France it was resource shortages with 32 per cent and in Germany it was ageing populations with 35 per cent. Perhaps some of these were aware of the recent UN finding that half the global city population will be over 60 by the year 2050, and many of the conveniences that address age-related changes (automobiles, elevators, air-conditioning) are highly dependent on energy.

These results underline the huge diversity of opinions on this topic across the different European countries.

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APPENDIX A: Detailed Breakdown of Survey Questions

Q1: Are you the business owner or director/senior decision maker with your organisation?

	<u>Yes</u>	<u>No</u>
UK	25 % (123)	75% (377)
France	20% (100)	80% (400)
Germany	19% (94)	81% (406)
Italy	36% (178)	64% (322)

Q2: If yes, how much more than what you are spending would you be prepared to pay to make your business energy efficient?

	0%	2%	5%	10%
UK	21% (26)	32% (39)	33% (41)	14% (17)
France	13% (13)	29% (29)	34% (34)	24% (24)
Germany	19% (180)	15% (14)	39% (37)	27% (25)
Italy	7% (12)	9% (16)	45% (80)	39% (70)

Q3: In your view, which of the following is the most important next step that your city should take to make itself 'greener' and more sustainable?

	Slashing CO2	Increasing	Creating	Improving	Decreasing

	Emissions by 20% by 2020	taxes on all energy use	'energy efficient' buildings	roads to minimise congestion	pollution in rivers, streams and waterways
UK	22% (108)	8% (39)	30% (152)	28% (140)	12% (61)
France	32% (157)	2% (11)	23% (116)	20% (101)	23% (115)
Germany	32% (158)	3% (16)	25% (126)	24% (119)	16% (81)
Italy	41% (206)	1% (7)	33% (165)	12% (59)	13% (63)

Q4: How much extra on top of what you are spending today would you pay to live in a green 'energy efficient' home?

	2%	5%	10%	Only interested if free of charge
UK	22% (108)	25% (126)	11% (56)	42% (210)
France	21% (103)	32% (159)	15% (77)	32% (161)
Germany	18% (88)	32% (158)	20% (99)	30% (155)
Italy	11% (54)	36% (183)	39% (194)	14% (69)

Q5: Which of the following is the most pressing environmental concern you have with your city's future?

	Scarcity of	Carbon	Expensive	Traffic (too	Over	I do not
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	fresh water	emissions	electricity	many cars on the road)	population	have any concerns
UK	7% (33)	18% (90)	28% (140)	23% (116)	17% (84)	7% (37)
France	15% (79)	17% (81)	27% (136)	21% (105)	9% (45)	11% (54)
Germany	6% (28)	20% (98)	34% (172)	24% (121)	5% (27)	11% (54)
Italy	14% (72)	29% (142)	16% (82)	31% (157)	6% (29)	4% (18)

Q6: Which of the following would you be prepared to do to make your city more environmentally friendly place to live?

	Change my mode of transport	Buy locally to support local businesses and farmers	Increase energy efficiency	Plant trees in local area
UK	13% (64)	45% (227)	28% (139)	14% (70)
France	18% (88)	42% (210)	21% (105)	19% (97)
Germany	13% (67)	37% (179)	25% (127)	25% (127)
Italy	19% (93)	24% (120)	40% (200)	17% (87)

Q7: Which of the following do you see as the greatest challenge to sustainable cities (cities designed with environmental impacts in mind) in the future?

	Growing Populations	Ageing Populations	Global trends like climate change	Shortages of water and other key resources
UK	43% (213)	26% (128)	20% (101)	11% (58)
France	21% (107)	19% (95)	27% (137)	33% (161)
Germany	18% (88)	35% (175)	34% (173)	13% (64)
Italy	14% (69)	21% (103)	39% (197)	26% (131)