



CZECH REPUBLIC
DEVELOPMENT COOPERATION



Market research report on sheep wool building insulation

**(Questionnaire based survey for individuals and business
entites in Ulaanbaatar, Erdenet and Darkhan cities)**

Ulaanbaatar city 2014

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ABBREVIATIONS

SWBI	Sheep wool building insulation
HPU	Housing and public utilities
AHPU	Administration of housing and public utilities
TA	Tenants' Association
UB	Ulaanbaatar
BZD	Bayanzurkh district
SHD	Songinokhairkhan district
BGD	Bayangol district
CHD	Chingeltei district
SBD	Sukhbaatar district
KHUD	Khan-uuldistrct
PIN	People in need
IO	International Organization
TV	Television

FOREWARD



The market research presented to the reader in this publication has been conducted by People in Need NGO and Development Solutions NGO within the scope of the project “Turning Sheep Wool into Environmentally Friendly Building Material Integrated Approach for Supply Chain Development”, funded by the European Union SWITCH-Asia program.

The aim was to provide baseline information to the different stakeholders of the construction sector regarding needs and constraints of the market of insulation material and more specifically Sheep Wool Insulation.

I would like to stress, amongst many others, a couple of interesting findings and draw some tentative conclusions.

Ger district dwellers face the highest cost for the heating of their premises (house or ger) and are logically very sensible to reducing this amount by improving their living environment, including insulation and moving from a ger to an individual house. This information tends us to believe that ger areas have a potential to improve into a more residential urban development scheme and, altogether, pollutant emissions could on the long run significantly decrease by the simple fact that houses would be properly build and insulated.

On the other hand, residents of apartment blocks have a low awareness and interest in cutting heat losses, although quality of insulation of these buildings is most of the time weak, to say the less. Communal heating system and very low price of the utility bill act as a disincentive to operating meaningful energy efficient decision. We are afraid that only a deregulation of energy prices and a strong enforcement of energy efficient policies are the only ways to inflect the current situation.

Nevertheless, the survey assesses the huge potential of insulation market and will provide the reader with useful marketing trigger to develop the sales of these products.

I am sure that Sheep Wool building insulation, with its specific qualities (healthy, quasi neutral life cycle, etc.) and the fact that it is a pure Mongolian product, will meet an increasing demand in the construction sector in the next years.

I would like to thank very much all the Development Solutions NGO team for their great work as well as MrPetrSchmied, from People in Need Headquarters, for his support. My regards are also going to the entire project’s team of People in Need Mongolia for their considerable role.

Quentin Moreau

Head of Mission
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Research works were aimed at identifying SWBI awareness among public and gathering relevant data to assess marketability of SWBI through pre-developed questionnaire to analyze competitiveness of traditional insulation materials at local markets, identify potential buyers and to evaluate the insulation market capacity. Total of 699 individuals and business entities were participated in the survey in Ulaanbaatar, Darkhan, Erdenet cities. Individuals were divided into four groups depending on the type of dwelling: a) people living in wooden/brick house; b) traditional yurts; c) apartments; and d) communal houses, while business entities were categorized according to type of entities: a) Administration of housing and public utilities; b) construction materials trading company; c) individual salespeople; d) construction design developer and construction company.

The survey was mainly focused on insulation use with as much as 88.4% of total respondents were individuals, business entities representing 11.6%. The use and demand of building insulations, identification of SWBI awareness were the priority areas for the survey for individuals, while the use and demand of building insulation, operational and material cost borne for insulation assembly during construction and the total number of buildings constructed were the subjects for study at business entities level. The research also outlines the preference factors for the purchase of insulations among respondents, the sources and availability of information about building insulation, SWBI awareness among users, and marketing advantages and challenges for SWBI.

As it's been revealed, the buyers are willing to use an insulation product if it is a national brand with high quality and low price. Upon premium insulation performance by SWBI with modest price tag, it can be reasonably sold at domestic markets if attentive cares are taken to minimize the risks of rotting, releasing unpleasant odors and attracting insects.

It has also been made clear that the majority of individuals use TV, and rumors between friends and acquaintances as primary source of information, while business entities use online information, expos as credible source of information. The use of SWBI is currently nil. The majority of people, living in wood/brick houses and apartments are mostly interested in reducing heating cost.

Styrofoam and glass-wool make up 80%-90% of the insulation material market currently, which makes them the top competitor for SWBI. The fact, that the stone-wool, a closest ally to SWBI in qualitative and quantitative aspects, holds only 5%-7% of the market share because of its high price, certainly annuls the producer's expectation to sell SWBI at higher price.

In conclusion, the SWBI can gain certain market shares through well planned promotion and awareness campaign to target groups, developing easy-to-use technologies and increasing insulation performance of SWBI yet at lower costs. It is highly recommended to producers to implement aggressive marketing strategies to attract big construction companies that use insulation in greater amounts, as well as developing national norms and standards for SWBI for construction.

2

SCOPE OF RESEARCH WORK

2.1. Objective

To identify level of public awareness of green construction materials especially SWBI, to conduct market research analysis of SWBI through questionnaire based survey method, to collect data for analysis, to identify potential buyers, to identify and study competing products/brands, and to assess the overall capacity of building insulation market.

Activities

- Public awareness and information:
 - To identify public awareness level of sustainable, green construction materials
 - To identify public awareness level of building insulation
 - To identify public awareness level of energy efficiency
 - To identify public awareness level of SWBI
- Market for SWBI – market size
 - To identify SWBI users
 - To identify users' purchasing capacity (cash, credit, etc)
 - To identify the geographical locations of SWBI users
 - To identify existing number of SWBI buyers (SWBI sales volume)
- Market for SWBI:
 - To calculate the actual insulating cost of different types of dwellings by SWBI
 - To calculate cost difference between uninstalled and insulated buildings using SWBI
 - To calculate the payback period based on current heating cost, as well as future costs
 - To identify the types of people who are looking to reduce heating costs
 - To identify the types of people who are ready to buy SWBI
 - To identify best approaches to make SWBI more marketable
 - To identify best means/ways to promote SWBI
 - To estimate insulation cost of 1-2 demonstration building with SWBI (Common wooden house, school building etc.)
 - To identify existing promotion methods by construction material sellers to different buyers groups
 - To develop best indicators to identify potential SWBI buyers
 - To learn about specific requirements or expectations for branding, quality assurance and after sales services, etc, of SWBI, that area likely to be raised by potential buyers of SWBI

2.2. Methodology

Survey method

Simplerandom sampling method was used in the survey. The survey was administered through a questionnaire developed and pre-tested with the technical assistance of specialists from PIN. 7 pagesquestionnairewas made up of standardized, both open and close ended questions for seven different focus groups mentioned below (see Appendix for questionnaire format)

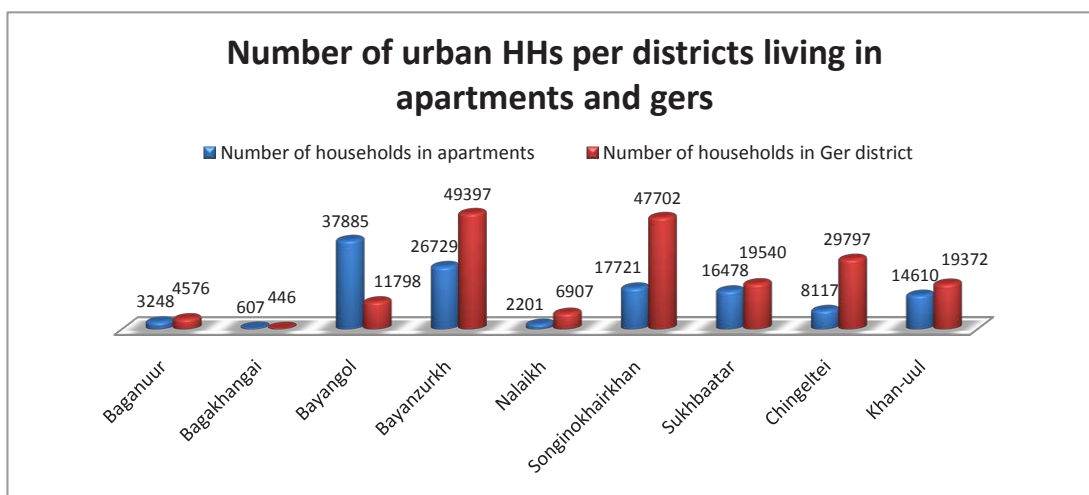
- I. People, living in wooden/brick houses
- II. People, living in yurts around the year
- III. AHPU
- IV. People, living in apartments, Tenants' Association
- V. Construction designer
- VI. Construction material selling individuals and entities
- VII. Construction companies

The sample frame and size were determined in accordance with the population number, density and concentration of districts. Table 1 shows the number of population in each district as of Dec 2013, according municipal statistical bulletin.

No	District	Population	Percentage
1	Bayanzurkh	304,323	24.02%
2	Songinokhairkhan	277,312	21.89%
3	Bayangol	200,163	15.80%
4	Chingeltei	155,859	12.30%
5	Sukhbaatar	133,293	10.52%
6	Khan-uul	131,097	10.35%
7	Nalaikh	33,235	2.62%
8	Baganuur	27,936	2.20%
9	Bagakhangai	3,806	0.30%
Total		1,267,024,	100.00%

Table 1. The number of population in each district

The urban households are found living in two main residential areas; modern apartments and suburbs, known as ger district, according to statistical bulletin of Ulaanbaatar city.



Graph 1. Number of apartment and ger dwelling HHs

District name	Percentage of households in apartments	Percentage of households in Ger district
Baganuur	41.51%	58.49%
Bagakhangai	57.64%	42.36%
Bayangol	76.25%	23.75%
Bayanzurkh	35.11%	64.89%
Nalaikh	24.17%	75.83%
Songinokhairkhan	27.09%	72.91%
Sukhbaatar	45.75%	54.25%
Chingeltei	21.41%	78.59%
Khan-uul	42.99%	57.01%
Total	40.23%	59.77%

Table 2. Percentage of apartment and ger dwelling HHs

Total of eight enumerators were recruited and trained accordingly to get full knowledge of survey objective and outcomes. The field test of the questionnaire was done for three days to vet enumerators. In order to receive feedbacks, SWBI samples were shown to respondents during survey.

To ensure the accuracy of survey results, the statistical figures were widely used during entire research work. The survey data was later processed using MS Office and Eviews, the statistical analysis software. The Eviews was generally used to assess samples' histogram and other variables, to define correlation between variables and to do regression analysis. Due to some variables data went missing, some variables are log transformed in regression model.

The correlation between some indicators, the factors that led buyers to choose an insulation, use and demand of insulation were identified. The major sales channels for insulation materials, including potential sales channel for SWBI were also identified. The survey also revealed the major channels from where people get information regarding quality, price and usages of insulation.

Survey approaches

- Meetings, discussion
- Questionnaire
- Policy documents
- Statistical data

Software and hardware for survey

- Hardware
 - o Vehicle
 - o Personal computer
 - o Printer
 - o Scanner
 - o Digital camera
- Software
 - o MS Office programs
 - o Eviews, statistical analysis tool

2.3. Timeframe and target groups

Length: Research work commenced on 1st of May 2014 and finished on 16th of June 2014. All preparatory works, including finalization and field testing of questionnaire, training of enumerators, have been completed by May 9. All collected data were computed before 30 May by the time when household survey was already complete. The survey team worked on finalizing data processing and report writing until 16 May.

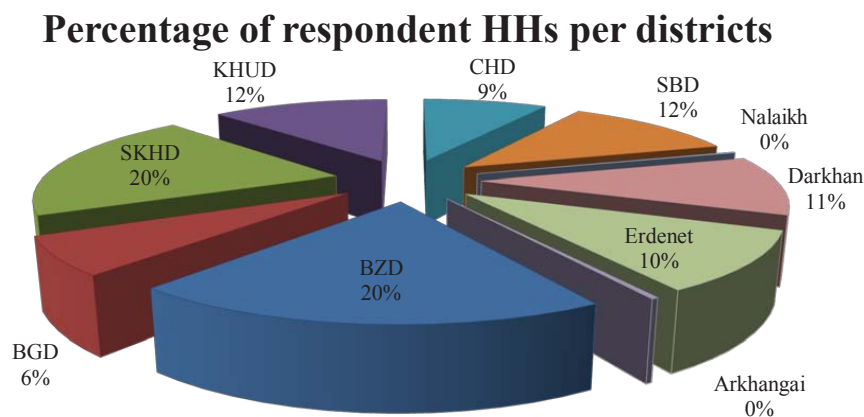
The focus groups sites: The total number of respondents is 699 representing residents and business entities from all nine districts of Ulaanbaatar including Darkhan, Erdenet cities and Arkhangai aimag. Total of seven focus groups were identified and surveyed. Table 3 shows the number of respondents by focus groups.

Number of respondents and focus groups

No	City	Survey sites	Measuring unit	People, living in wooden/brick houses	People, living in gers around year	AHPU	TA, people living in apartments	Construction designers	Construction material traders	Construction companies	Total
1	UB	BZD		96	25	2	12			2	137
2	UB	BGD		17	9	1	19				46
3	UB	SKHD		92	25	2	13		8		140
4	UB	KHUD		61	14	1	9				85
5	UB	CHD		28	11	1	8	7		5	60
6	UB	SBD		45	12	1	10		7	7	82
7	UB	Nalaikh		1							1
8	Darkhan	Darkhan		56				4	9	5	74
9	Erdenet	Bayan-Undur		55				4	8	5	72
10	Arkhangai									2	2
Total				451	96	8	71	15	32	26	699

Table 3. Number of focus groups and respondents

The percentage of respondents by the place of residence



Graph 2. Percentage of respondent HHs per districts

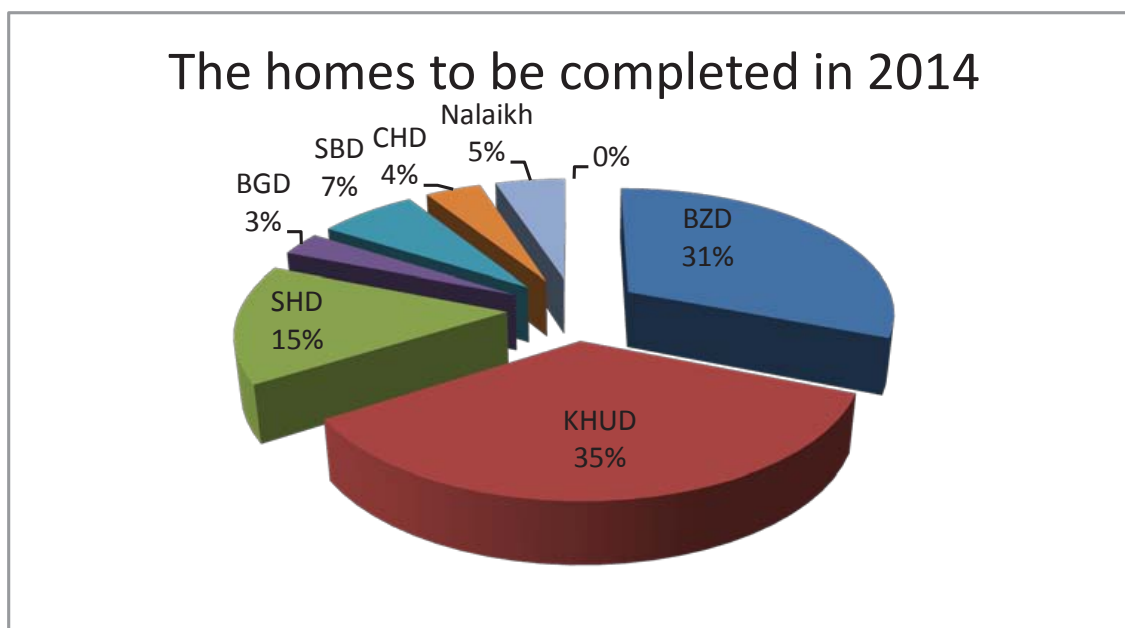
The respondents were randomly selected from following areas in each survey site.

No	Survey sites	Areas
1	BZD	Sharkhad, microdistict#16, Amgalan, Tsaiz, Altan-Ulgii, Monel, Dari eh, Sansar, Amgalan
2	BGD	Zuragt, Microdistrict#6, 3,4,10
3	SKHD	Bayankhoshuu, Orbit, Zuunsalaa, Khanin material, microdistrict#1
4	KHUD	Nisekh, Yaarmag, 120 myangat
5	CHD	7 buudal, Denjiin 1000, Khailaast, Bayanburd
6	SBD	Belkh, Selkh, Dari ekh, Dambadarjaa, 5 buudal, 50 myangat
7	Nalaikh	Downtown of Nalaikh
8	Darkhan	Darkhansoum
9	Erdenet	Bayan-undursoum
10	Arkhangai	Tsetserlegsoum

Table 4. Areas that the respondents were selected

Residential housing supply

As many as 21450 residential apartment units under 211 housing projects are likely to be put into operation in Ulaanbaatar in 2014, against 37049 apartment units initially projected under 150 housing projects, which denotes almost 30% increase in residential housing supply against the same period in 2013. The homes, to be completed in 2014, will be located in following districts;

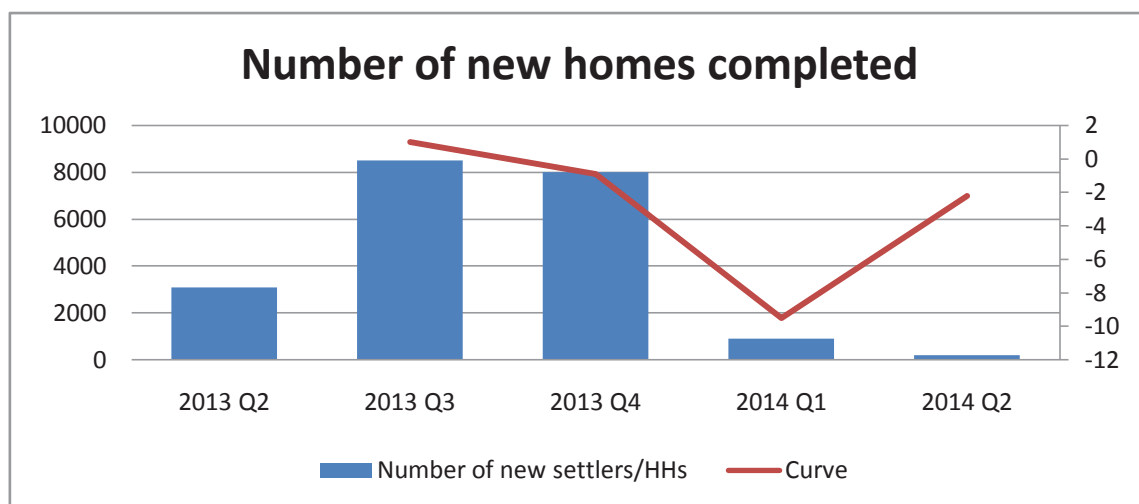


Graph 3. The percentage of new residential apartment units to be completed in 2014, per districts

Almost 66% of total new homes are built in Khan-Uul and Bayanzurkh districts alone. An average cost per square meter of new apartments is varying according to their locations, but the highest one is in Sukhbaatar district where a square meter area in new homes costs around 2.71 million MNT. For example, 1m² areacosts 2.43 mln in Chingeltei, 2.62 mln in Khan-Uul, 2.15 mln in Bayanzurkh, 2.15 mln in Bayangol, and 1.53 mln MNT in Songino – Khaikhhan district. The supply of residential apartments tends to remain strong and stable until 2016, backed up with a fact that the implementation of more mid and long-term residential housing projects over reserved areas for construction is planned under urban development master plan. However, the supply of new homes in ger areas may be challenged by the slow process of re-planning of ger areas.

№	Urban area category	Area /hectare/	Percentage
1	Gerarea	9,752	27.7%
2	Constructed area	6,712	19.1%
3	No construction area	6,890	19.6%
4	Area reserved for construction	7,703	21.9%
5	Others	4,149	11.8%
	Total	35,206	100%

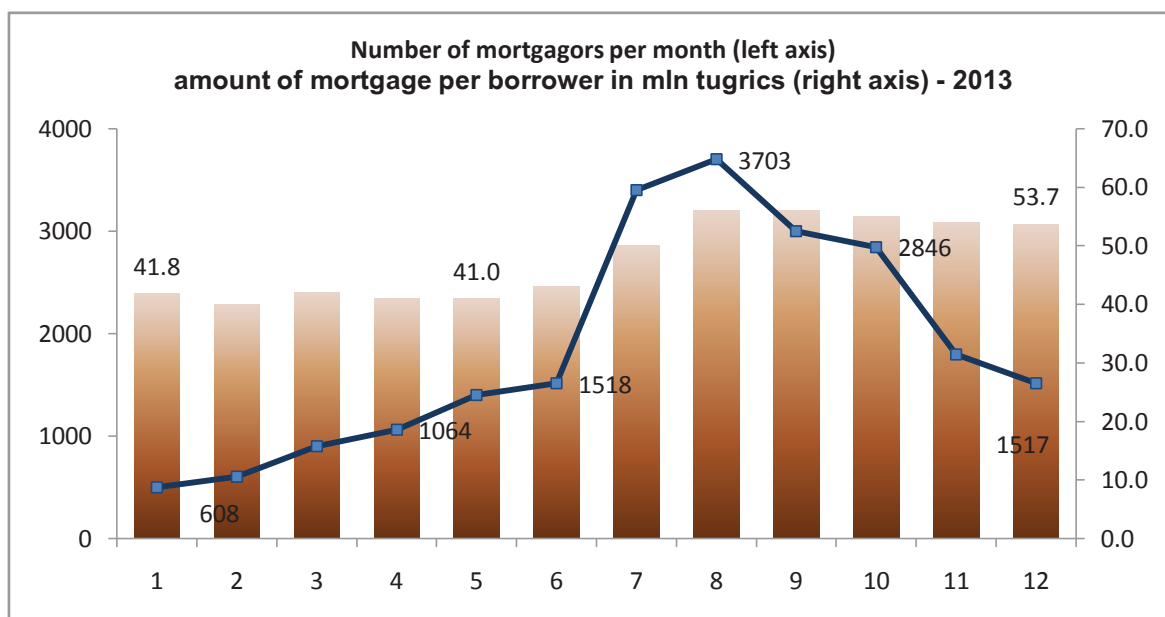
Table 5. Areas under current urban planning



Graph 4. Number of new homes completed

Housing demand

One of the key indicators that point a shift in the dynamics of housing market is the total amount of mortgage loans issued and number of mortgagor in a given month. Since the launch of program, the mortgagors' number remained high until it reached its record high in August last year, and it keeps dropping ever since.

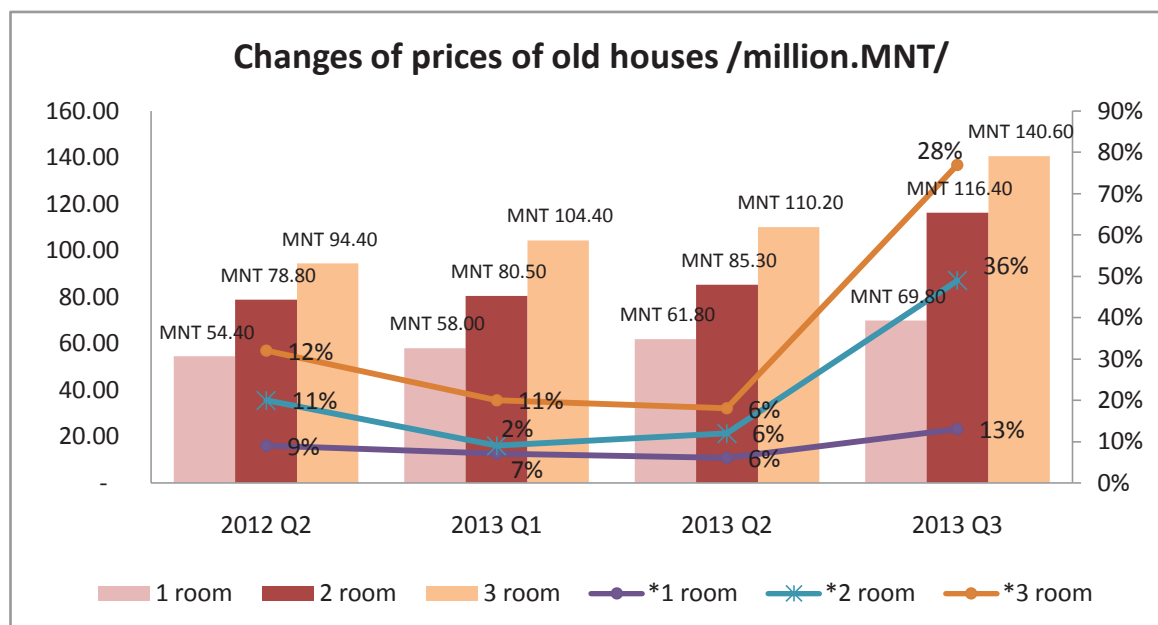


Source: Mongol bank, (*assumption)

Graph 5. The total amount of mortgage issued and number of mortgagors in 2013

The decline is expected to continue further upon allegation that new homes become less affordable to regular citizens even with the contribution of housing mortgage program with 8% annual interest rate. Peoples' purchasing capacity is significantly dropped and can't catch up with soaring price of new homes. Mongol Bank may start to look for bit less in loan applicants and be less strict, but this is not expected to bring heat back to the housing market. What is likely to happen in the future is the program may continue in a way that those who already own homes use housing mortgage loan to improve their housing conditions. These findings led the researchers to conclude that there wouldn't be significant changes in

the dynamics of housing market in 2014, but the season may witness some modest increase in housing supply, however new homes sales drop and financial shortcomings with some housing projects are likely. The price of old houses is on the rise as well, triggered by the soaring price of new homes.



Graph 6. Changes of old house prices

The commercial banks started to reduce interest rates in the first quarter of 2013, resulting in moderate increase in housing demand and new homes price. New homes prices jumped 15-20% in the same year as economy heated up with credit expansion in the name of housing mortgage program with 8% annual interest. Subsequent abrupt increase in the housing demand was also recorded.

The reduction of mortgage interest has direct implications on households' demand for mortgage debt. Total amount of mortgage issued to households in June 2013 alone increased by 4.7% or 46 billion MNT against the previous month, while the annual figure rose by 40% or 294.9 billion MNT against the same period of preceding year and reached 1032.2 billion MNT in 2013.

Following the launch of housing mortgage program with 8% annual interest in June 2013, the weighted average interest rate reduced from 16.6% to 12.9% with number of mortgagors increased from 10% to 16%. Record low mortgage interest rate led to heating up of housing market thus causing price for new homes to soar. The dynamics of housing market are shown in Table 6 below.

Month, Year	Demand		Supply	Difference	Percentage
	Total number of households in UB	Number of people who can afford new houses	Newly built functional houses		
End of 2012	312	228	117	111	51.3%
End of 2013	331	241	144	97	59.8%

Table 6. Demand and supply ratio of new homes

The Table 6 shows high demand for housing during period of reduced mortgage interest rate.

The dynamics of construction materials market of last year are shown below.

Construction materials price /MNT/

Made in	Product	2012 June	2013 May	2013 June	Annual growth	Monthly growth
Mongolia	Cement M-500	9,075	9,400	8,500	-6.3%	-9.6%
	Light concrete 700	148,500	150,700	150,700	1.5%	0.0%
	Red brick M -100 / thousands/	286,000	318,000	298,500	4.4%	-6.1%
	Processed log (15x15), dry	28,000	28,000	28,000	0.0%	0.0%
	Vacuum windows (15x15)	85,000	90,000	90,000	5.9%	0.0%
Russia	Lead (rocky) 1x10m	22,000	21,500	22,500	2.3%	4.7%
China	Cement M -500	8,500	7,500	6,500	-23.5%	-13.3%
	Lead (without rocks) 1x15	9,000	8,000	8,000	-11.1%	0.0%
	Window glass 5mm (decent quality)	13,000	12,000	12,000	-7.7%	0.0%

Table 7. The dynamics of construction materials price

Table 7 shows significant price drop for some construction materials such as cement, bituminous waterproofing membrane, window glass, as a result of government policy to stabilize construction material market by provision of soft loans to importers in 2013. However, the prices of domestically produced materials such as red brick and light concrete showed insignificant increase against the same period in 2012.

The total output of construction sector, as of Dec 2013, is shown below:

CONSTRUCTION AND CAPITAL REPAIR OUTPUTS BY ENTITIES, by building types, at current prices, at the end of the selected years

Type of building	2011	2012	2013*	$\frac{2013^*}{2012}$	%
Construction and capital repair outputs	745 020.5	811 272.0	1 452 208.8	179.0	
Residential building	222 233.8	263 805.9	399 478.3	151.4	
Non residential building	204 181.1	282 445.9	341 095.6	120.8	
Building of the industry	7 648.0	48 875.5	10 438.3	21.4	
Trade and service	24 209.7	31 034.3	61 331.6	197.6	
Hospital, school, cultural institutions	105 807.4	113 015.9	151 177.3	133.8	
Other	66 516.0	89 520.2	118 148.5	132.00	
General engineering construction	248 193.3	158 700.8	640 835.7	403.8	
Energetics	41 073.9	29 532.3	55 272.9	187.2	
Communication	90.3	144.0	164.8	114.4	
Railway	9 074.7	2 648.4	3 848.4	145.3	
Road	109 962.5	54 573.5	477 006.5	874.1	

Bridge	15 435.2	14 675.6	38 344.3	261.3
Dam, ditch, cable, network	44 243.5	44 626.8	31 088.8	69.7
Minor works & other	28 313.1	12 500.2	35 110.0	280.9
Capital repair and maintenance	70 412.2	106 319.4	70 799.3	66.6

Note: *- Preliminary estimates

Table 8. Construction and capital repair outputs

As of 2013, the total investment for construction of residential, non residential buildings and capital repairs of existing buildings accounted for 1,081,669.6 million MNT, inclusive of procurement and installation costs for insulation.

4

MARKET RESEARCH

4.1. Households and housing situation

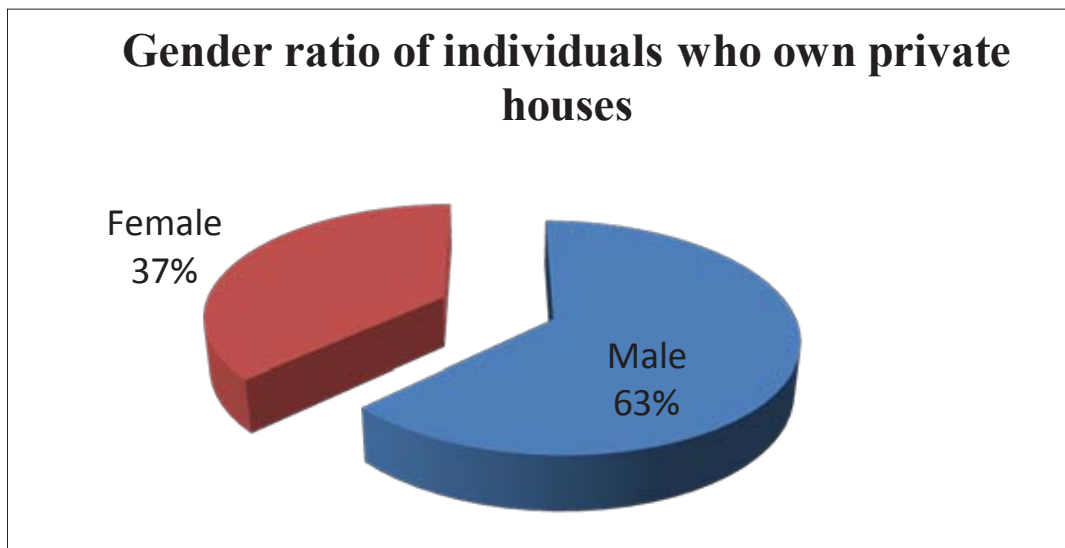
4.1.1. Households living in wooden/brick houses (basic detached house)

There were total of 451 respondents who live in basic detached house made of wood/brick combination.

No	Districts	No of respondents	Percentage
1	BZD	96	21.29%
2	BGD	17	3.77%
3	SKHD	92	20.40%
4	KHUD	61	13.53%
5	CHD	28	6.21%
6	SBD	45	9.98%
7	Nalaikh district	1	0.22%
8	Darkhan city	56	12.42%
9	Erdenet city	55	12.20%
Total		451	100.00%

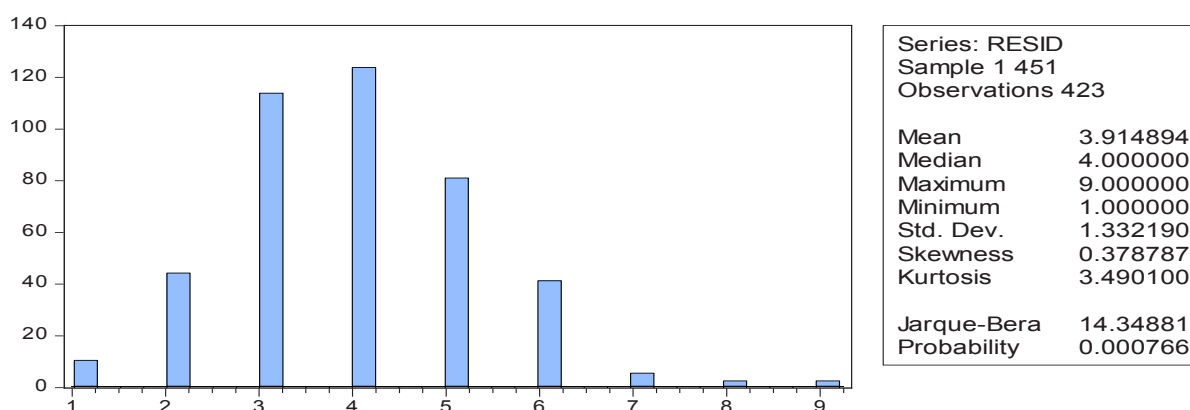
Table 9. Number of respondents living in basic detached house

The gender ratio of respondents



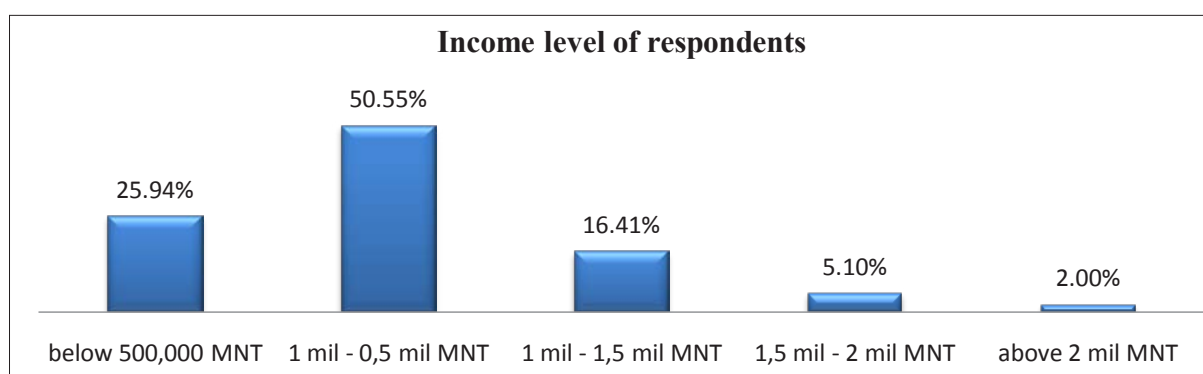
Graph 7. The gender ratio of respondents who own private houses

Histogram of respondents' household members shown below:



Graph 8. Histogram of respondents' family members

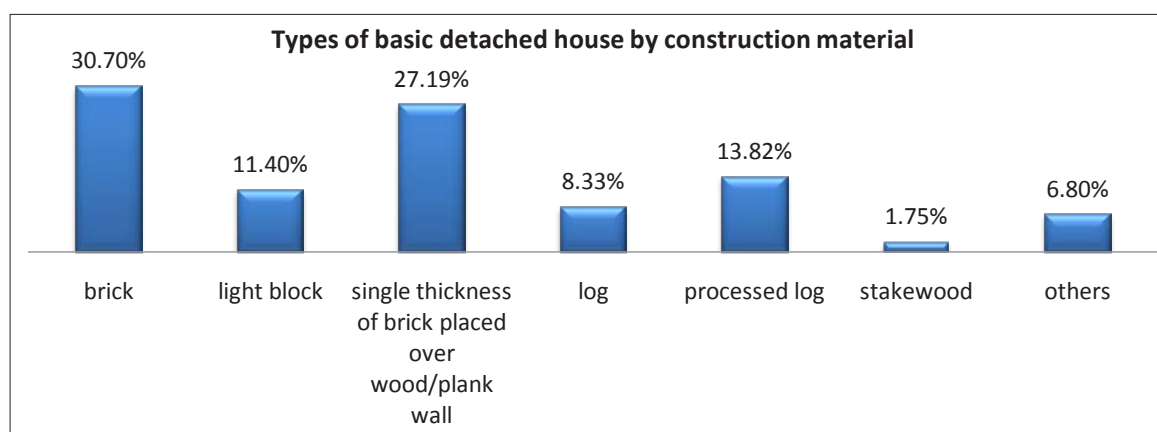
Based on the graph above, 423 households were registered and the average number is 3.9. By looking at histogram, it looks similar to anormal spread. This will obey/follow the normal spread if a random sample is taken.



Graph 9. Income level of respondents

The fact that HHs with monthly income level of less than 1 mln MNT makes up as much as 76% of total respondents indicates the weak purchasing power of HHs.

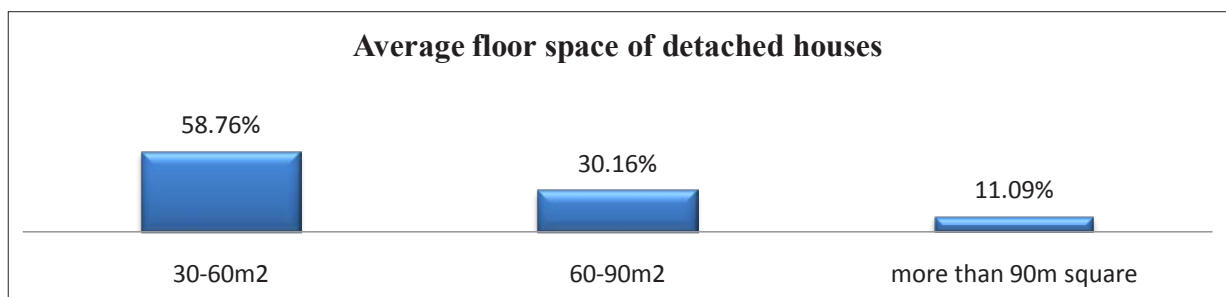
The types of basic detached house by main construction material are shown on Graph 10.



Graph 10. Main construction material for basic detached houses

The most common type of basic detached houses is the one built of wood/plank walls with single thickness of brick placed over, as revealed by survey. Not only do the wood and brick act as main building material, but also they need excessive amount of insulation to keep the house warm. The market research analysis also proved that almost 57% of the house insulation is used for walls.

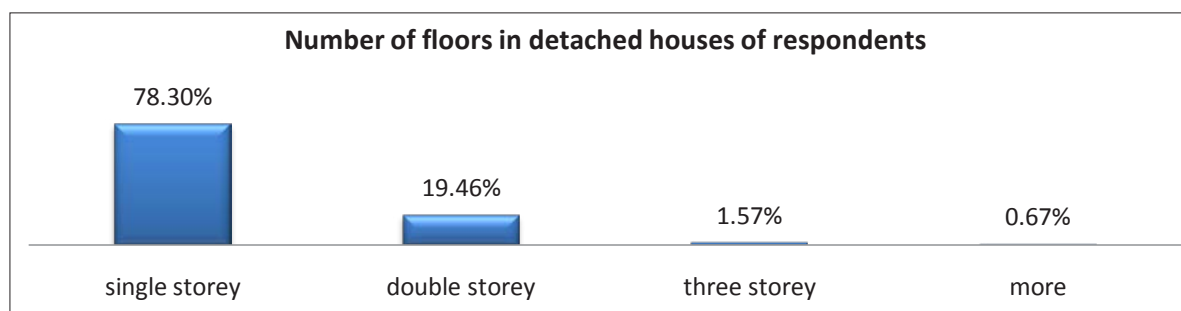
Following graph shows average floor space of basic detached houses:



Graph 11. Average floor space of detached houses

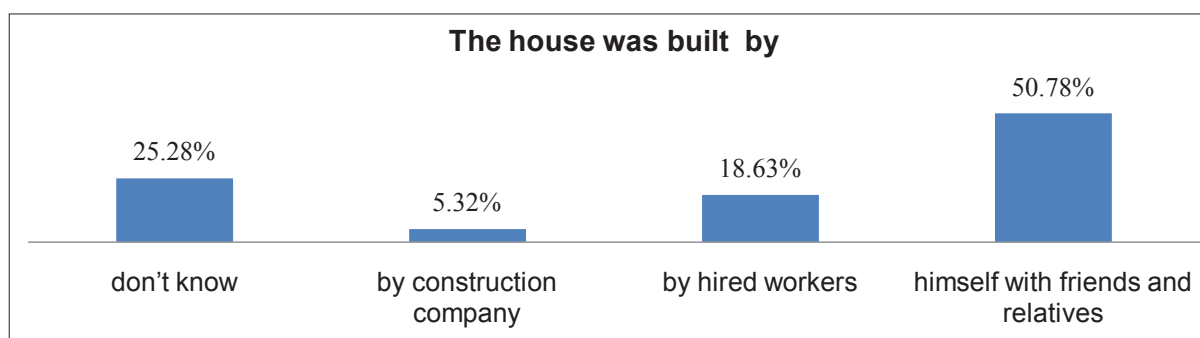
Majority of respondents was found living in houses with small floor space. As much as 70% of people with a modest monthly income of 500,000 MNT and less, and 57% of those who are able to earn 500,000 – 1,000,000 MNT per month live 30-60m2 houses, which means the household income and floor space of house the family living in can be seen as directly proportional.

Now, let's take a look at the number of floors in detached houses of respondents.



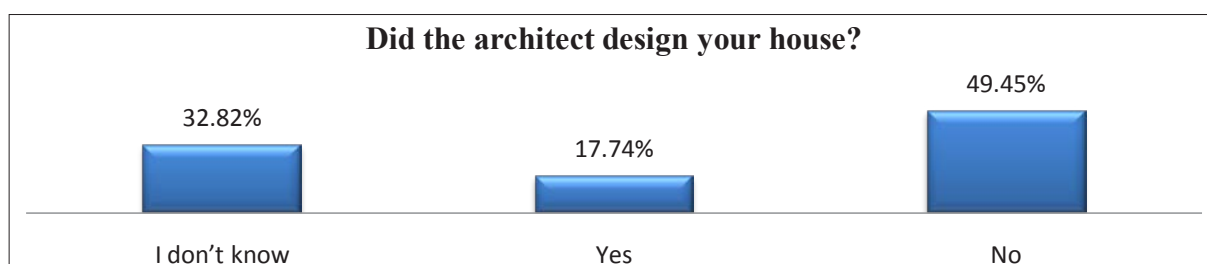
Graph 12. Number of floors in detached houses of respondents

Following graph shows who built the respondents' houses.



Graph 13. Who built the respondents' houses

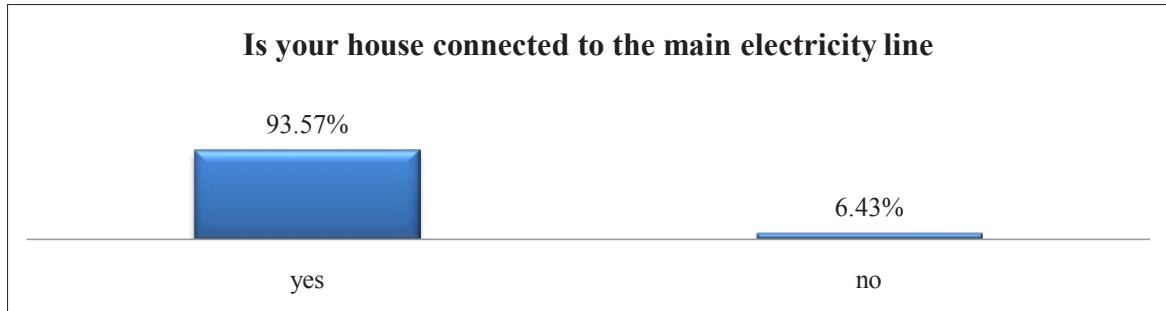
Below graph shows if the house was built by the architect's design.



Graph 14. Percentage of houses, built by the architect's design

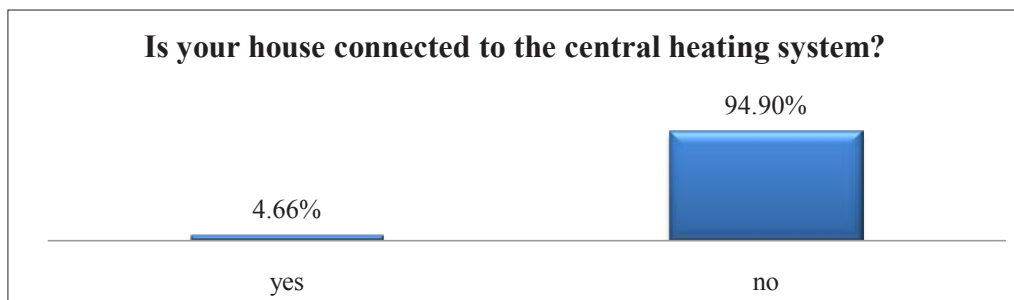
The graph shows that only 17.74% of total houses were built by the architects' design, while 32.82% of respondents either bought the house or didn't know who built the house. The rest respondents simply realized own designs and fantasy when they build own houses. Here, one can conclude that architects' or construction designers' role in building small basic detached houses is not imperative.

No living can be comfortable without electricity and heating, and Graph 15 and 16 shows the connectivity of respondents' houses to electricity and central heating system.



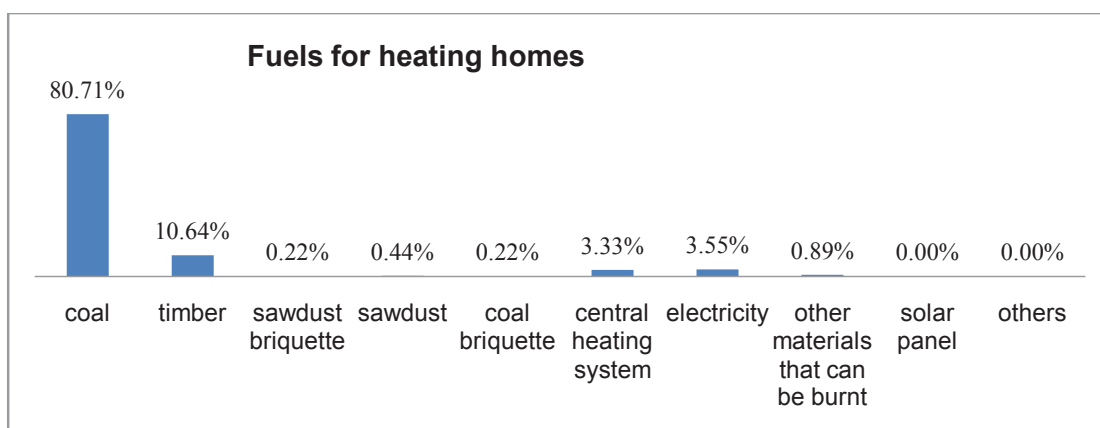
Graph 15. Percentage of houses connected to the main electricity line

93.57% of total respondents' houses were found connected to main electricity line while 94.9% were not connected to central heating system.



Graph 16. Percentage of houses connected to the central heating system

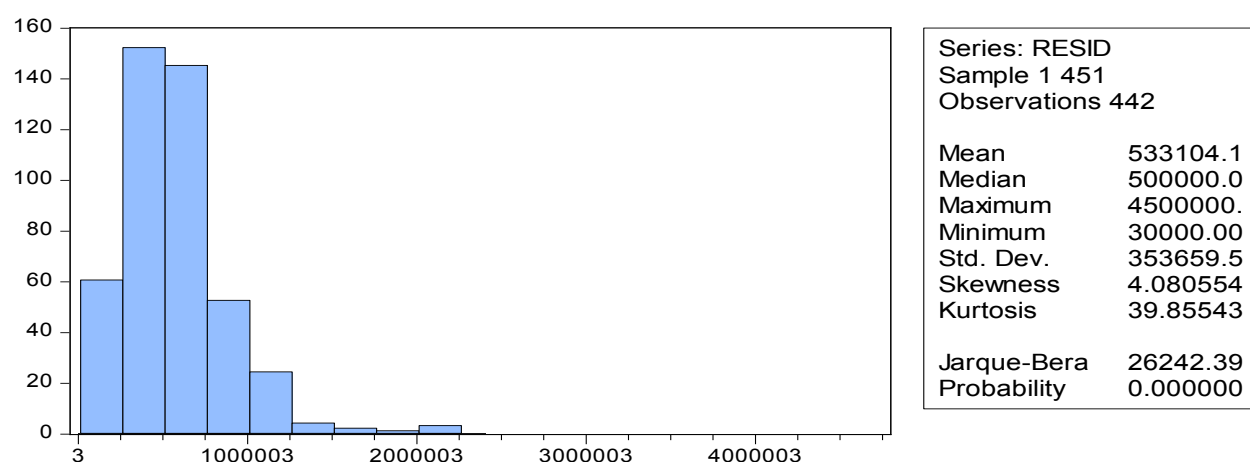
Negligent percent of houses are connected to central heating system, and the types of fuels the households rely on are shown below.



Graph 17. Fuel types for homes heating

Majority of households burns coal for heating their homes. As much as 73% of total respondents in Erdenet city alone acknowledged timber as main fuel, which makes up almost 9% out of 10.64% of total respondents who admitted timber as main fuel. The phenomenon

may be explained by the low cost of timber in Erdenet. The annual coal consumption per one household averages at 4 metric tons with total market value of 533,000 MNT, roughly 2 full light trucks load.



Graph 18. Histogram of fuel consumption

The relationship between fuel consumption during cold season and size of household is shown below.

Dependent Variable: LOG(RESID)
Method: Least Squares

Sample: 1 451

Included observations: 414

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(RESID01)	-0.063893	0.078183	-0.817221	0.4143
C	13.10195	0.106026	123.5725	0.0000
R-squared	0.001618	Mean dependent var		13.01881
Adjusted R-squared	-0.000805	S.D. dependent var		0.607854
S.E. of regression	0.608098	Akaike info criterion		1.847859
Sum squared resid	152.3508	Schwarz criterion		1.867308
Log likelihood	-380.5068	Hannan-Quinn criter.		1.855550
F-statistic	0.667851	Durbin-Watson stat		1.423011
Prob(F-statistic)	0.414274			

Estimation Command:

```
=====
LS LOG(RESID) LOG(RESID01) C
```

Estimation Equation:

```
=====
```

LOG(Firewood cost) = C(1)*LOG(Number of family members) + C(2)

Substituted Coefficients:

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```

LOG(RESID) = -0.0638929425956*LOG(RESID01) + 13.1019476035

Table 10. The relationship between fuel consumption during cold season and size of HH

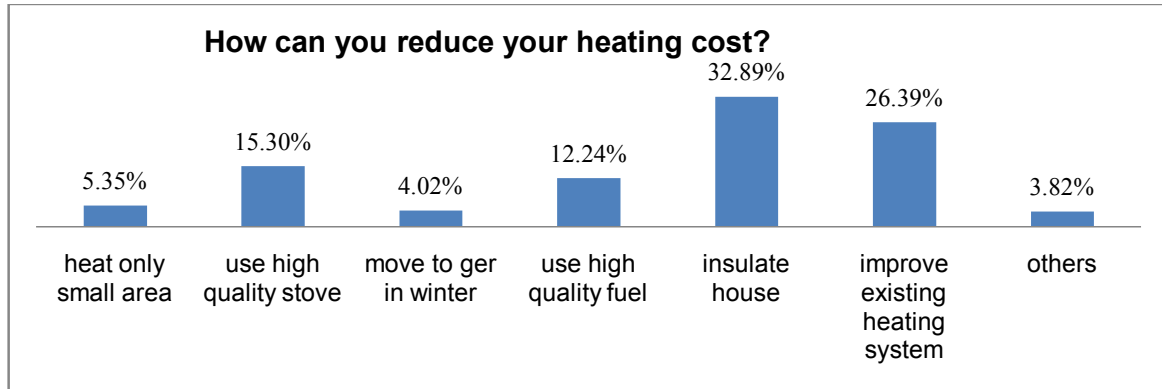
Regression analysis of the number of family members and fuel expenses is done using the method of least squares.

The simplified regression equation is below.

$$\text{Log(Fuel cost)} = -0,06389 * \text{Log(Number of family members)} + 13,10194;$$

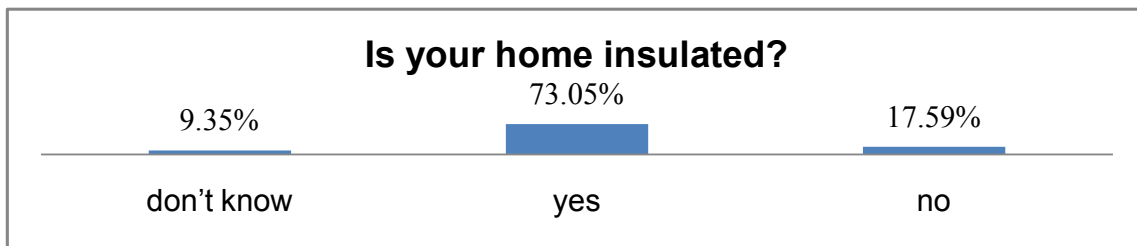
Conclusion: The number of family members is directly proportional to fuel cost.

Ways to improve energy efficiency in the house and reduce heating cost per year.



Graph 19. Ways to reduce heating cost

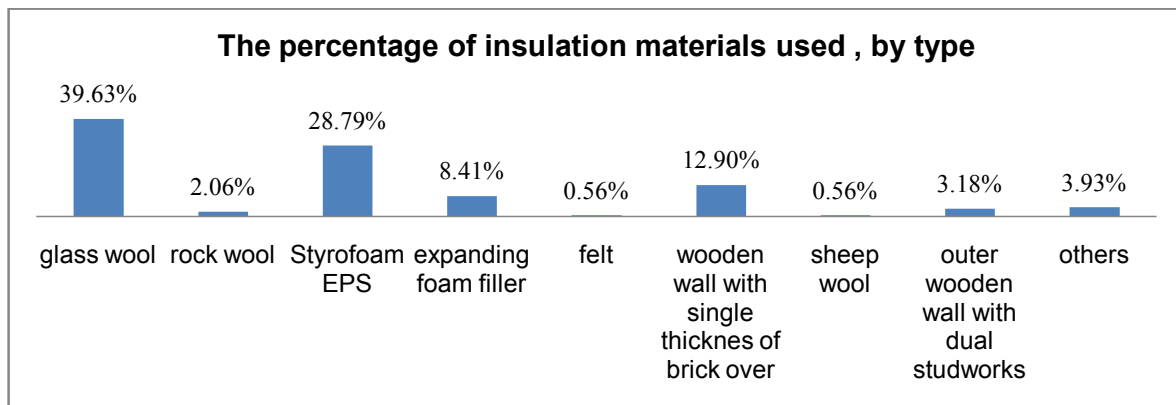
Significant 32.89% of respondents admitted the necessity of adding insulation to an existing home to stay warm during cold season. However, adding insulation depends on how much the household can earn to spend later.



Graph 20. Percentage of respondents admitted the necessity of adding insulation

73% of total houses are insulated. 60% of respondents answered "yes" to a question if any additional insulation is needed to existing homes. Rest was found satisfied with existing insulation performance. 45% of respondents who plans to add insulation to existing homes is looking to realize their plans within one year, 39% in 2-3 years time, while remaining few percent plans to do it after four or more years.

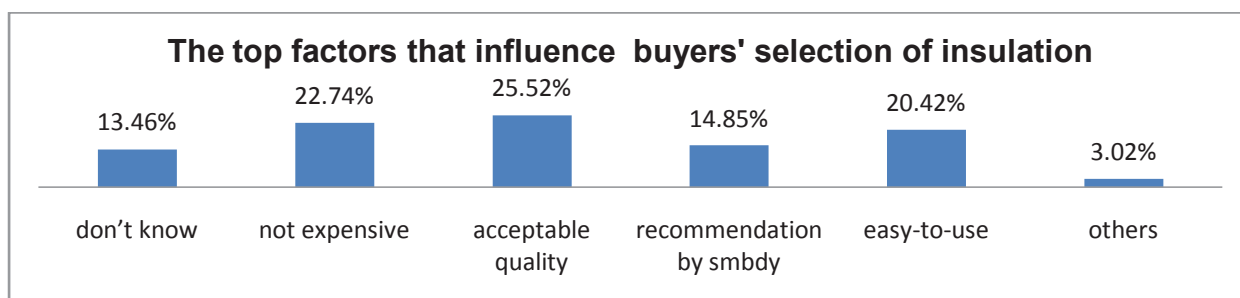
The types of insulation used in homes are shown below.



Graph 21. The percentage of conventional insulation materials used

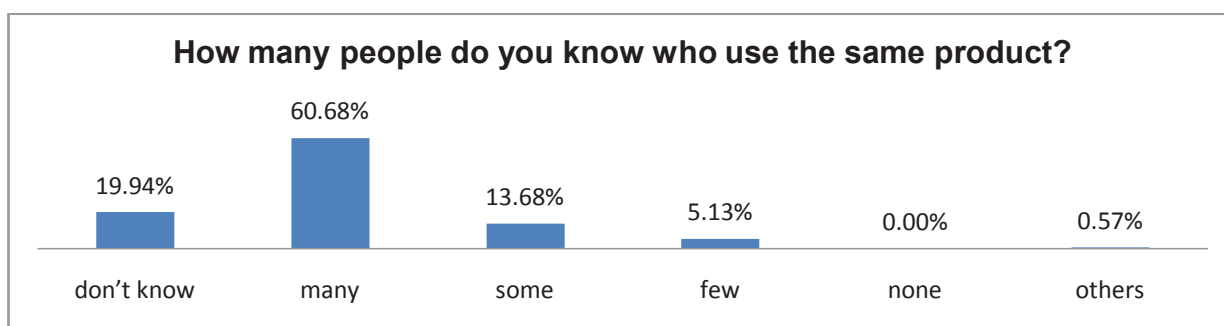
The most used insulations are glass wool and Styrofoam thanks to their low cost.

High quality, low price, and easiness to install are some of the factors that have strong influence on decision making.



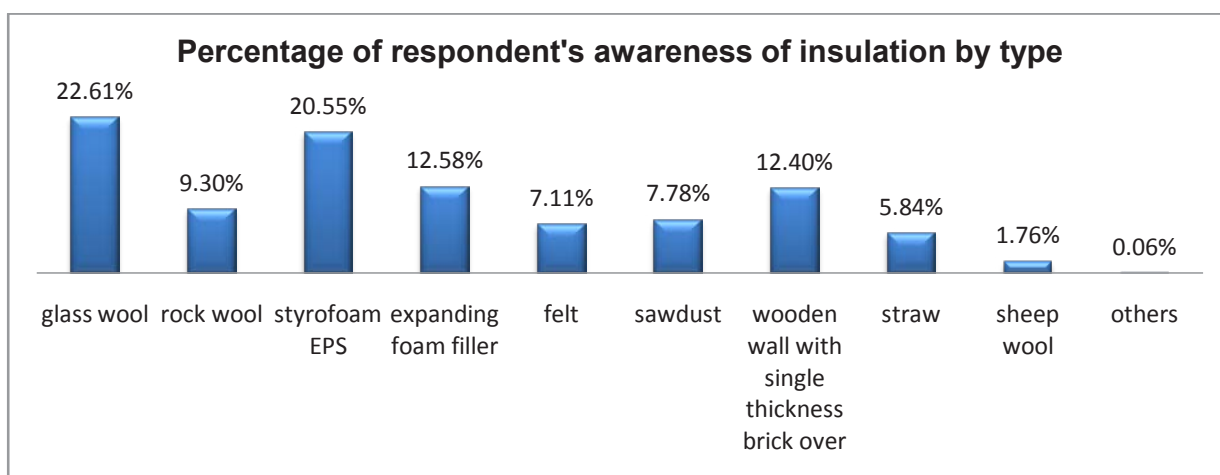
Graph 22. The factors that influence buyers' selection of insulation

61% of respondents admitted they chose a particular type of insulation just because many other people use it, which means the consumer's product's choice is mostly determined by the degree of usage of that product by the public.



Graph 23. Percentage of respondents whose choices are governed by the extent of consumers using same product

Respondents' awareness of insulation types show below:



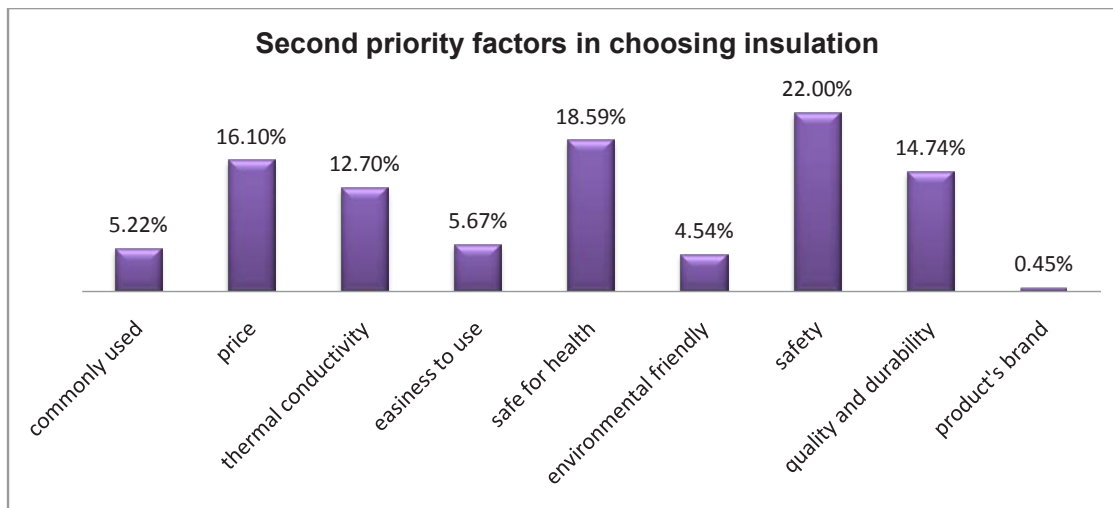
Graph 24. Percentage of respondent's awareness of insulation, by type

Glass wool and Styrofoam are the most common insulation types known to respondents. The key factors that influenced on respondents' insulation selection are detailed below.

Priority#	Commonly used	Price	Thermal conductivity	Easiness to use	Safe for health	Environment friendly	Safety	Quality and durability	Product's brand
#1(highest)	1.81%	34.99%	11.51%	3.16%	21.90%	1.58%	12.19%	12.19%	0.68%
#2	5.22%	16.10%	12.70%	5.67%	18.59%	4.54%	22.00%	14.74%	0.45%
#3	3.84%	9.48%	14.67%	9.71%	15.80%	8.13%	20.99%	16.03%	1.35%
#4	3.79%	11.14%	15.81%	17.59%	13.59%	11.14%	11.80%	13.59%	1.56%
#5	5.05%	10.32%	15.37%	20.18%	12.84%	17.20%	8.03%	8.26%	2.75%
#6	9.77%	8.64%	11.36%	21.59%	8.64%	18.41%	10.45%	7.50%	3.64%
#7	14.91%	4.36%	12.16%	14.45%	5.96%	18.35%	7.57%	14.22%	8.03%
#8	34.70%	4.11%	4.11%	5.25%	1.60%	15.30%	5.71%	11.87%	17.35%
#9 (least)	21.43%	0.46%	2.07%	2.30%	0.69%	5.53%	0.92%	1.38%	65.21%

Table 11. Priority factors for respondents' selection of insulation

The price (34.9%), health friendliness (21.9%), quality and durability (12.19%) are the top priority factors in deciding which insulation to choose. Following graph shows percentage of second priority factors that influence on choosing insulation.

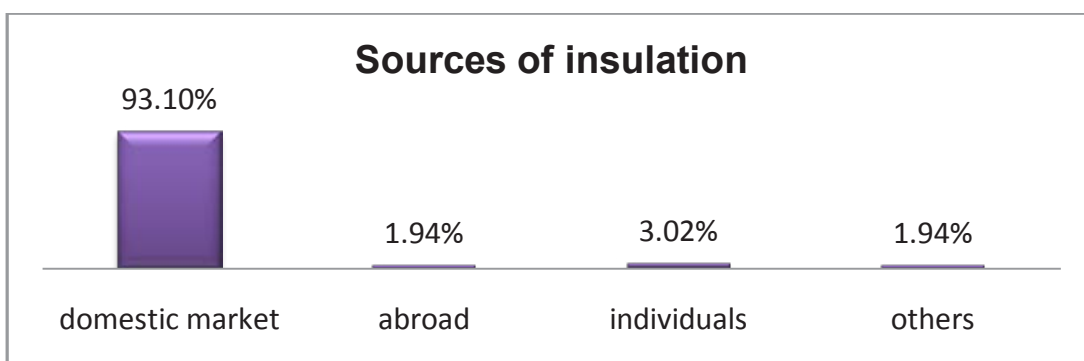


Graph 25. Second priority factors in choosing insulation

Here, the safety and health friendliness of insulation are the major issues of concern.

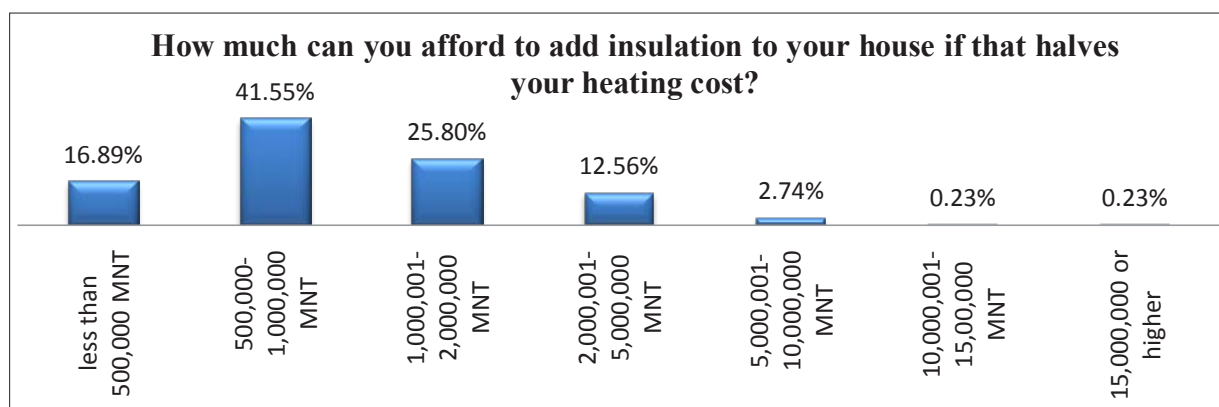
Price, health friendliness and safety of the insulation are the three priority factors that have strongest influence on selection of insulation. The same factors need to be considered when introducing SWBI into the construction material market for better results.

The sources of insulation materials are shown below.



Graph 26. Sources of insulation

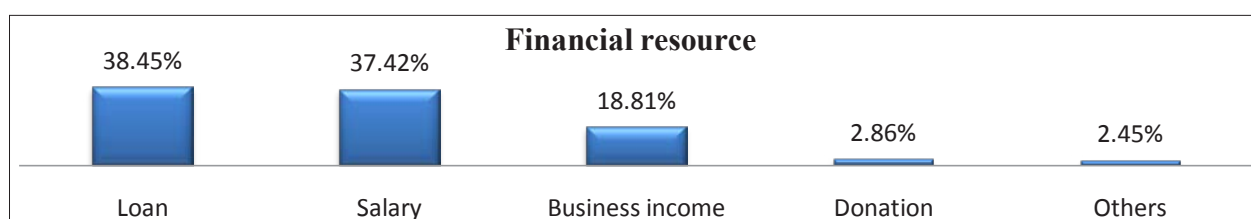
The following graph shows how much the respondents can afford to add insulation to homes.



Graph 27. Respondents' financial capacity to add insulation

Normal spread of spending is predicted if heating cost is reduced by 50% in Graph 27.

The respondents are expected to get money from following sources to finance adding insulation.

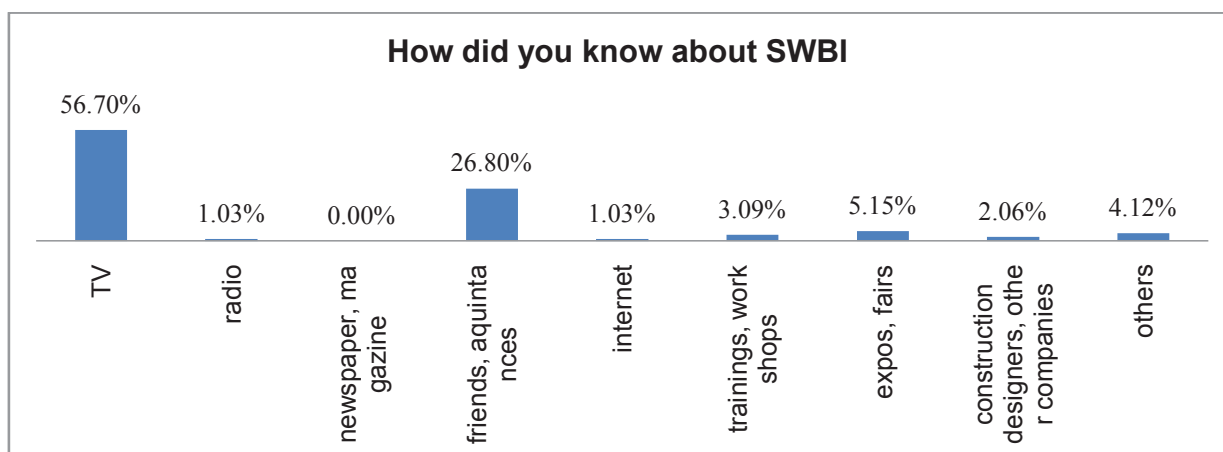


Graph 28. Financial resources for adding insulation

Most of the respondents will use bank loan and salary as financial resource for adding insulation. Those who will use some of their business incomes for re-insulation make up an insignificant proportion or 18.81% of total respondents. It can be literally understood that 18.81% of house dwellers run private business.

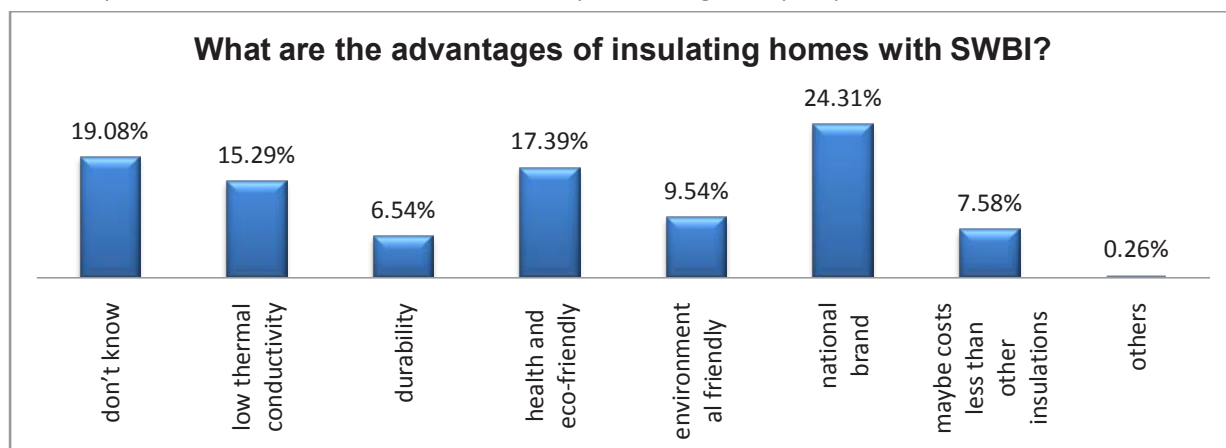
Only 22% or around 100 people out of total respondents admitted they heard of SWBI, which is almost 3.5 times smaller than those who know Styrofoam and glass wool. Unfortunately, those who admitted often confused SWBI with simple felt made of sheep wool.

Source of information about SWBI for respondents.



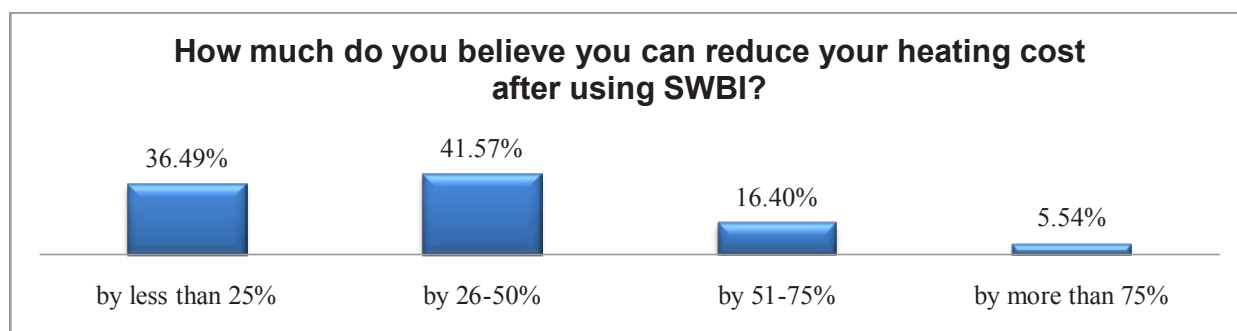
Graph 29. Source of information about SWBI

TVs and rumors were found to be the main sources of information for people.
 Respondents' feedback of SWBI after presenting sample product:



Graph 30. The advantages of insulating homes with SWBI, by respondents' view

The degree of respondents' belief in low thermal conductivity of SWBI thus heat heating cost is minimized, after feeling the SWBI.

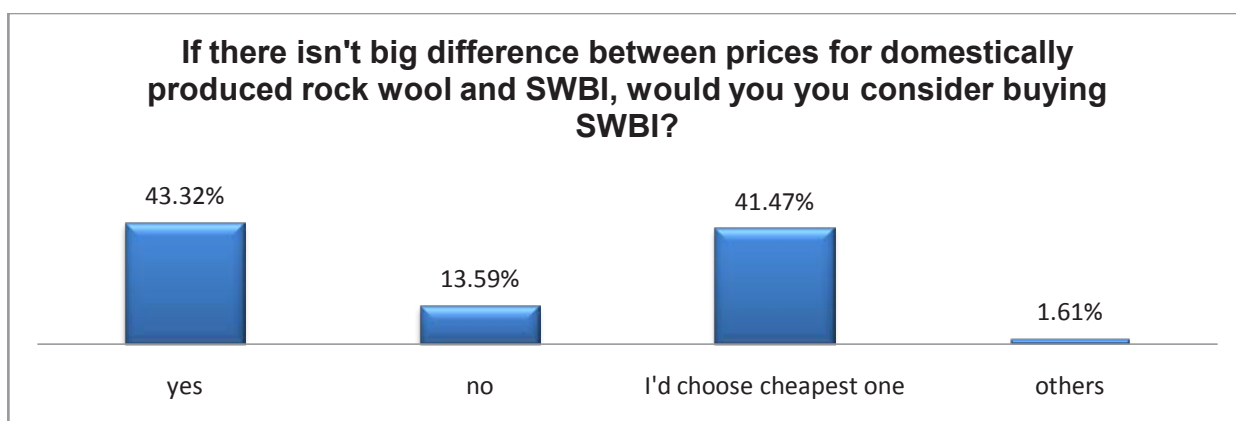


Graph 31. Percentage of heating cost reduction through application of SWBI (respondents' expectation)

According to the graph, 78% of respondents don't expect that use of SWBI can help them to save upto 50% of heating cost.

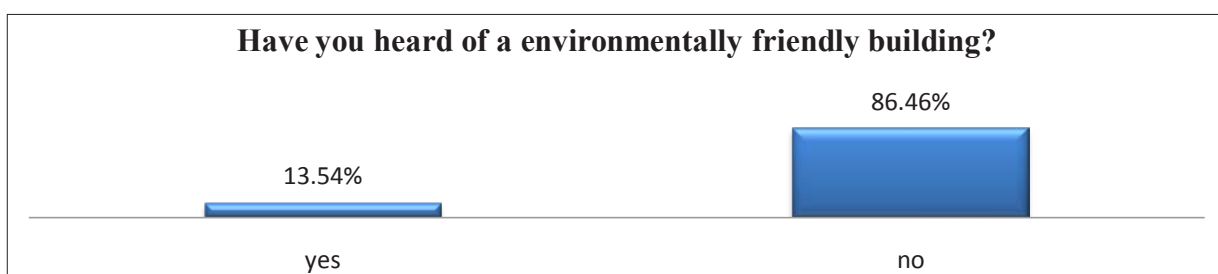
As much as 62% of total respondents answered "yes" to question if they are willing to use SWBI, reasoned by the assumptions that SWBI would be an environment and health friendly national brand product with low cost. Needless to remind that price and health friendly quality are one of the strong determinants of customer's product's selection. The rest refused to use SWBI amidst allegations that it might attract pests and rodents, possibly high cost and uncertainty of the product's quality as none has tested SWBI yet.

Refer to the final decision made by respondents when they were about to make choice from rock wool and SWBI.



Graph 32. Probability of choosing SWBI over rock wool in given situation

Apart from 43% of respondents who answered yes, there is a second big group of respondents who would choose cheapest one. If the cost of SWBI is lower than rock wool, the likelihood of SWBI replacing rock wool in the market is 85%. The people's awareness of green buildings can be seen from next graph.



Graph 33. Respondents' awareness rate of green buildings

More than 86% of respondents have never heard of green building or environmentally friendly building. Meager 13% of them admitted they heard of such building technology, and most of them named Canadian house as green house. Quite interestingly, almost 94% of respondents said they wanted to have own homes built by green house technology, which means there is greater potential for low cost, eco-friendly and safe insulation that poses no threat to human health like SWBI. However, SWBI cannot compete with glass wool or Styrofoam efficiently unless the market price of SWBI stays within the same range of glass wool and Styrofoam, revealed by the survey. On the other hand, SWBI can effectively replace rock wool if adequate measures are taken to minimize the risks of pest and rodent infestation, and foul smelling, and last but not least if the price remains similar to that of rock wool.

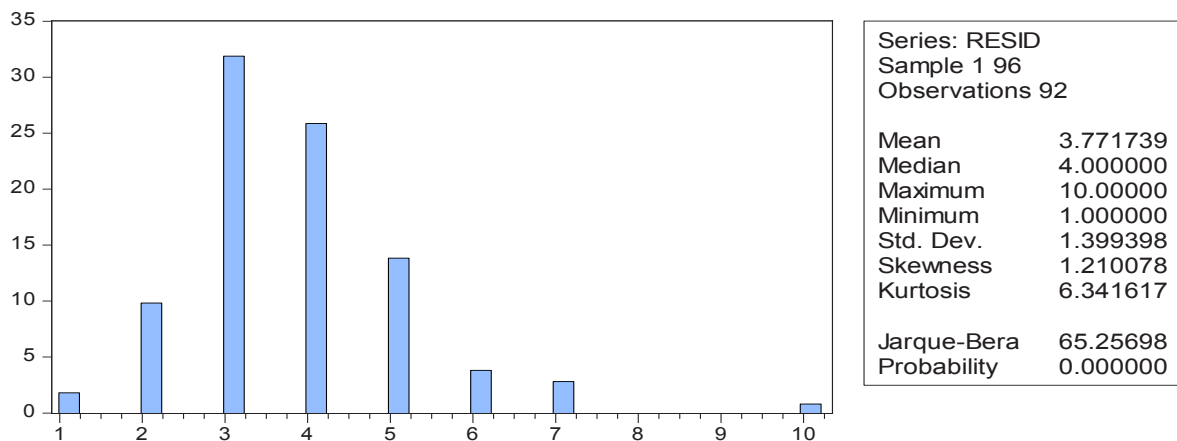
4.1.2. People who live in ger year-around

Total of 96 people who live in Gers year round were involved in survey. 66% of them were male, rest were female citizens. There were six focus groups in Ulaanbaatar city.

No	Location of focus groups	No of people in the focus group	Percentage
1	BZD	25	26.04%
2	BGD	9	9.38%
3	SKHD	25	26.04%
4	KHUD	14	14.58%
5	CHD	11	11.46%
6	SBD	12	12.50%
7	Nalaikh		0.00%
Total		96	100.00%

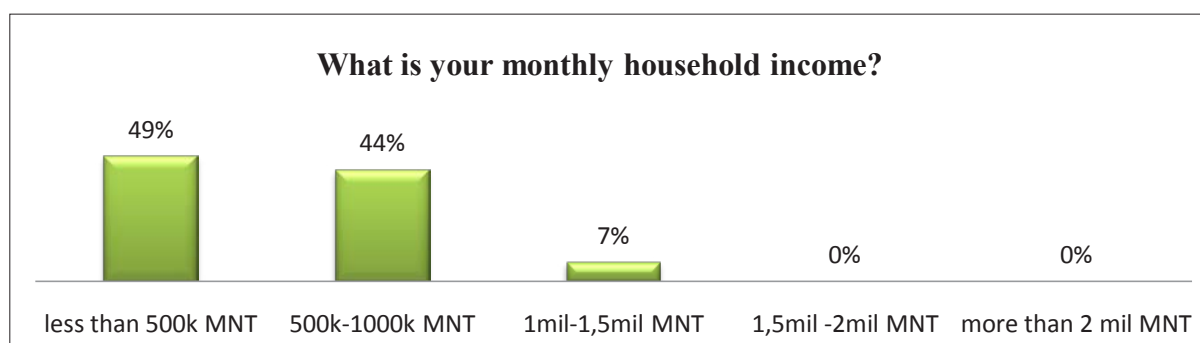
Table 12. Number of Ger dwelling respondents per districts

The household size of respondents



Graph 34. The sizes of respondent HHs

Household income



Graph 35. Household income rate

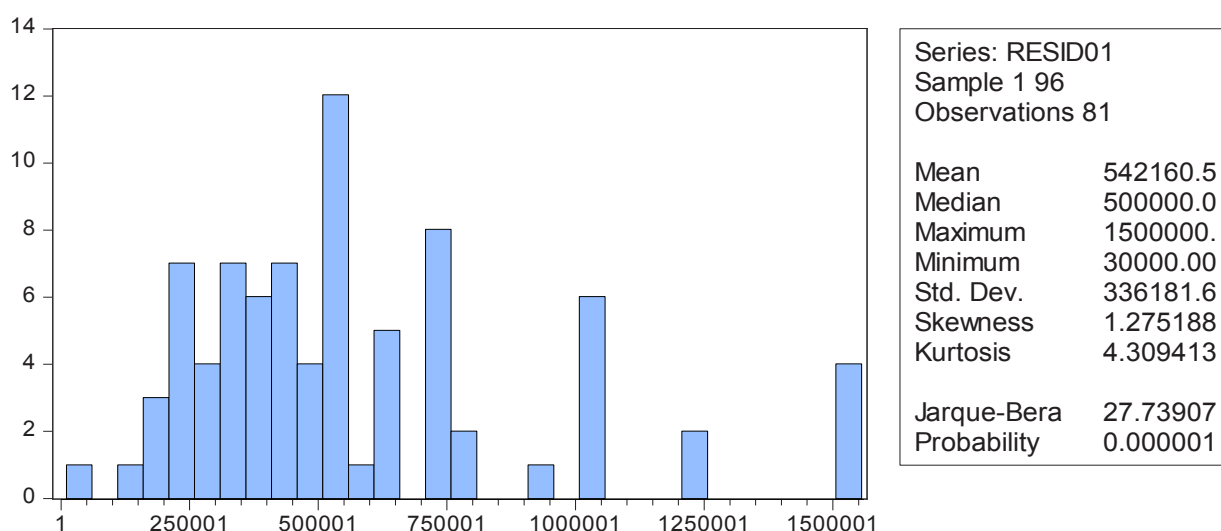
Respondents living in ger earn much smaller monthly income than respondents in basic detached houses do, almost half of the total respondents were found earning modest income of up to 500,000 MNT. Another 89% of respondents don't have house to stay in summer. The insulation of traditional yurt with layers of felt during winter

Number of felt layers	Single	Double	Others
Percentage	12%	85%	3%

Table 13. Number of insulating felt layers, used by HHs

82% of people use felt as main insulation of gers, while remaining few percent use synthetic base layer, thinner layer of felt, polyurethane and cartons as insulation.

The fuel cost data have been collected and processed as below.



Graph 36. The fuel costs borne by ger dwellers

The fuel costs an average of 540,000 MNT per household during winter time with reported minimum and maximum amount of 30,000 and 1,500,000 MNT. Regression modeling of fuel cost and number of household members is given below:

Estimation Equation:

$$\text{LOG(RESID)} = C(1) * \text{LOG(RESID01)} + C(2)$$

Substituted Coefficients:

$$\text{LOG(number of family members)} = 0.216541827794 * \text{LOG(fuel cost)} - 1.51806864671$$

Dependent Variable: LOG(number of family members)

Method: Least Squares

Sample: 196

Included observations: 80

Variable	Coefficient	Std. Error	t-Statistic	Prob.
LOG(RESID01)	0.216542	0.051151	4.233350	0.0001
C	-1.518069	0.668165	-2.271998	0.0258
R-squared	0.186833	Mean dependent var		1.306581
Adjusted R-squared	0.176408	S.D. dependent var		0.346778
S.E. of regression	0.314708	Akaike info criterion		0.550339

Sum squared resid	7.725208	Schwarz criterion	0.609890
Log likelihood	-20.01357	Hannan-Quinn criter.	0.574215
F-statistic	17.92125	Durbin-Watson stat	2.116733
Prob(F-statistic)	0.000062		

Table 14. Regression modeling of fuel cost and number of family members

The statistical parameters were evaluated by logarithming regression equation.

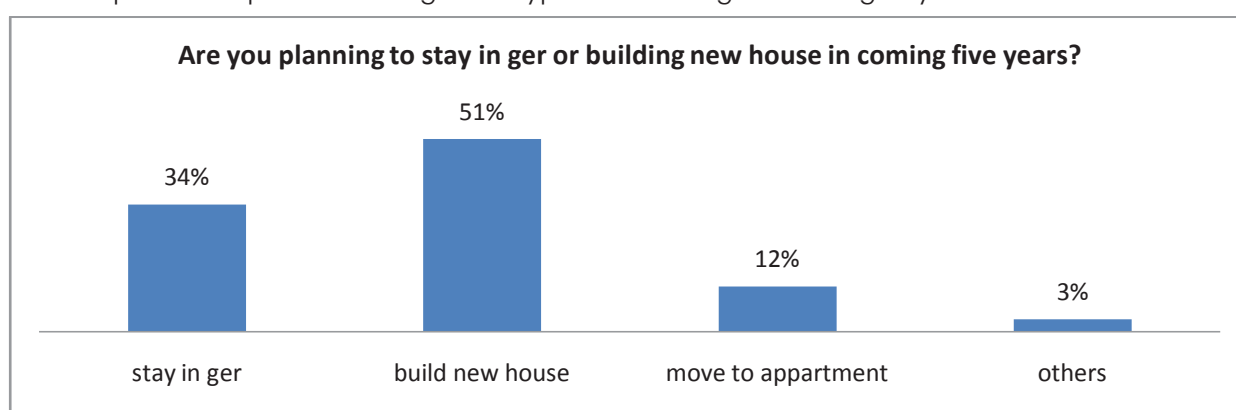
Maximum Absolute Correlations

	MAC
RESID	0.044542
RESID01	0.044542
Overall	0.044542

Table 15. Regression equation

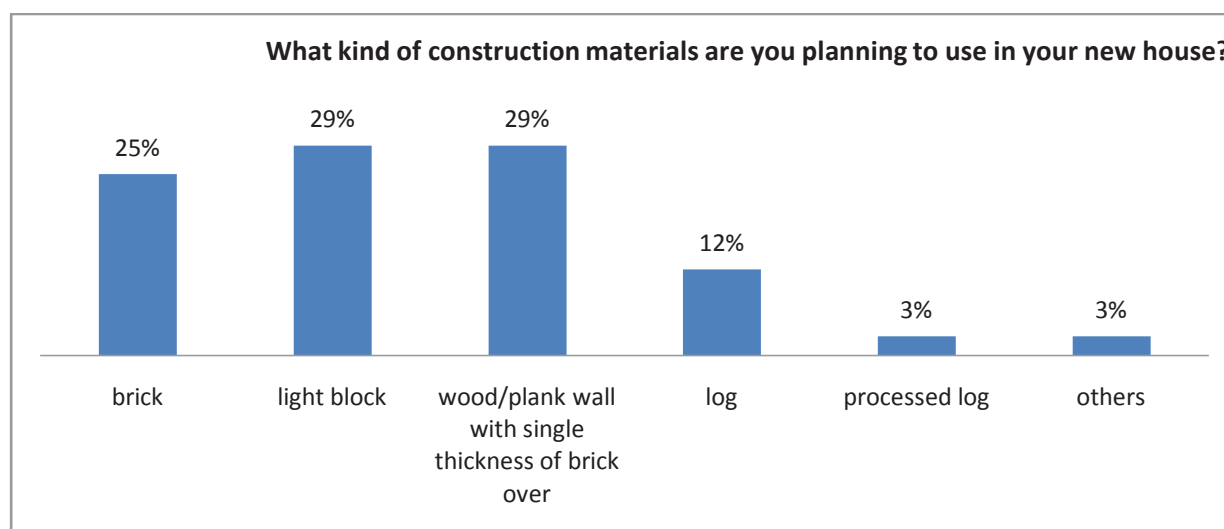
The direct relation is minimal after assessing correlation.

Respondents plan to change the type of dwelling in coming 5 years is shown below.



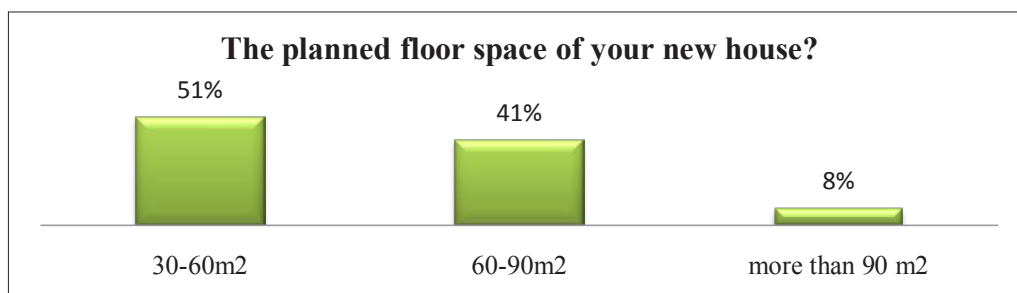
Graph 37. Respondents' plans about new housing

According to the graph 37, 51% of respondents plan to build new house, contributing to construction material and insulation markets. Following are the types of construction materials that the respondents are looking to use.



Graph 38. Main types of construction materials to be used in building new homes

The insulation is placed between inner and outer wall of house in recent years. Therefore, there is a potential to sell SWBI to 84% of total respondents who currently live in ger but plans to build a house in coming five years time. Next graph shows the planned floor space of new homes by respondents.



Graph 39. Floor space of new homes, by respondents' plan

According to Graph 39, majority of the respondents are planning to build a house with floor area of less than 90m². Less than 60m² houses are planned to be built by almost half of the respondents, and 54% of these respondents earns as much as 500,000 MT per month. The rest is able to earn more than 500,000 MNT. This fact proves that the floor space of planned houses gets bigger as the monthly income of respondents goes high. Naturally, the selection of insulation will largely depend on how much the respondents will be able to spend.

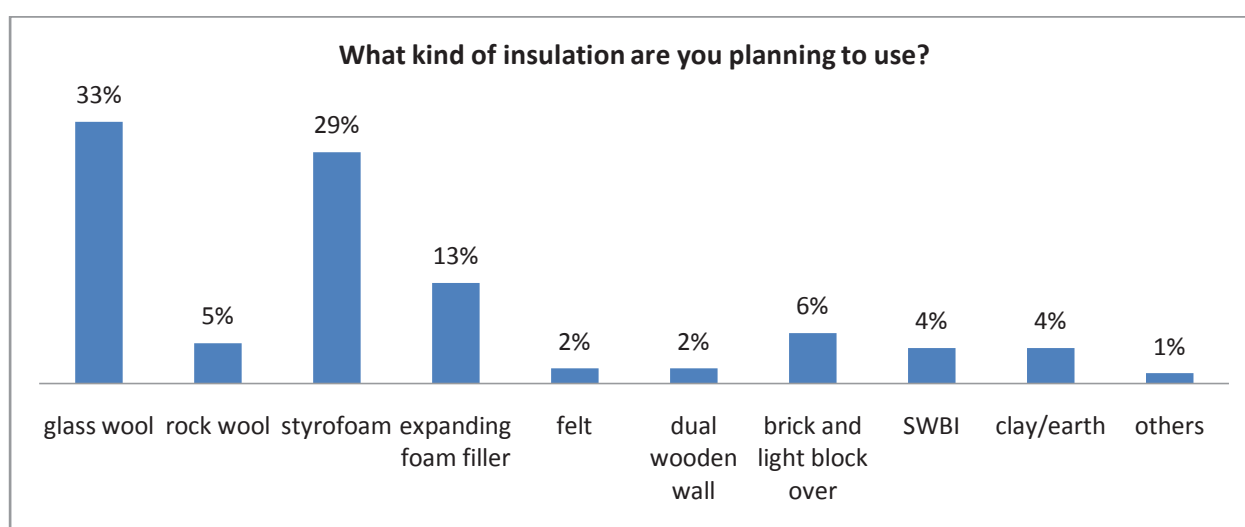
The financial resource of respondents to build new homes

Types of resource	Loan	Salary	Business income	Donation	Others
Percentage	48%	27%	18%	2%	5%

Table 16. The financial resource of respondents to build new homes

The building of new homes is expected to be financed by bank credit for almost half of the respondents, which again shows weak financial capacity of ger dwellers.

An overwhelming 97% of total respondents showed their strong interest in insulating new homes and following are the types of insulation they are looking to use.



Graph 40. Types of insulations, chosen by respondents for new homes

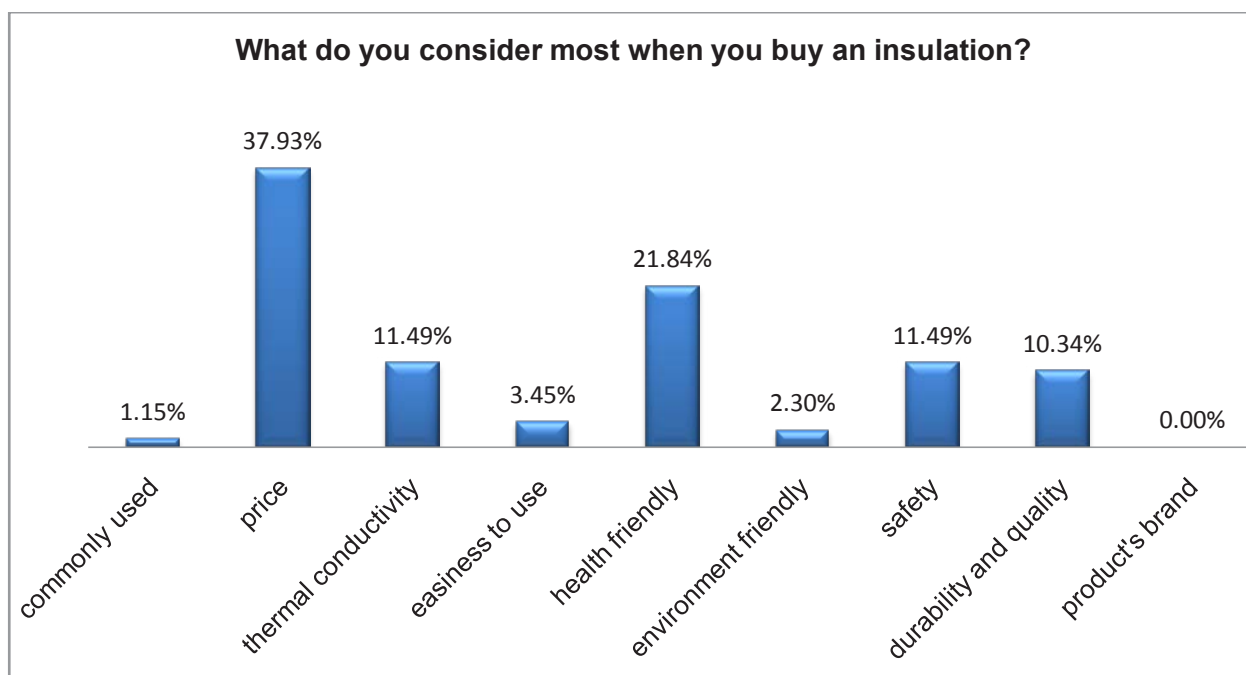
Again, the most common insulations are glass wool and Styrofoam. Setting out reasonable price within the same range of glass wool and Styrofoam, making it more durable and easy to use, will make SWBI more competent to common insulation. However, SWBI priced within the same range of rock wool, will be expected to deter low income households.

The key factors that influenced on respondents' insulation selection are detailed below.

Priority#	Priority	Commonly used	Price	Thermal conductivity	Easiness to use	Safe for health	Environment friendly	Safety	Quality and durability	Product's brand
#1(highest)	1 st	1.15%	37.93%	11.49%	3.45%	21.84%	2.30%	11.49%	10.34%	0.00%
#2	2 nd	8.05%	9.20%	17.24%	8.05%	10.34%	5.75%	27.59%	13.79%	0.00%
#3	3 rd	2.30%	14.94%	9.20%	11.49%	17.24%	6.90%	18.39%	19.54%	0.00%
#4	4 th	10.34%	13.79%	16.09%	9.20%	17.24%	10.34%	8.05%	14.94%	0.00%
#5	5 th	8.05%	5.75%	14.94%	24.14%	10.34%	19.54%	6.90%	8.05%	2.30%
#6	6 th	3.45%	4.60%	13.79%	21.84%	11.49%	17.24%	13.79%	12.64%	1.15%
#7	7 th	9.20%	4.60%	9.20%	14.94%	3.45%	24.14%	6.90%	10.34%	17.24%
#8	8 th	34.48%	6.90%	6.90%	4.60%	8.05%	9.20%	4.60%	10.34%	14.94%
#9 (least)	9 th	22.99%	2.30%	1.15%	2.30%	0.00%	4.60%	2.30%	0.00%	64.37%

Table 17. The priority factors for respondents' selection of insulation

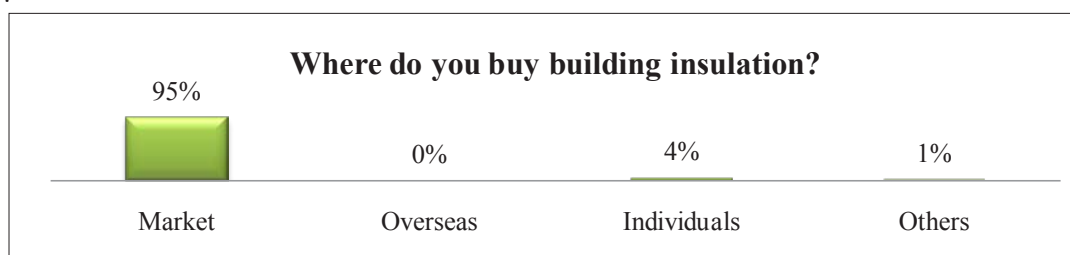
Let's take a look at the factors with top priority.



Graph 41. The top factors for respondents' selection of insulation

Like the respondents living in basic detached houses, the majority of respondents who live in ger year round give most priority to price and health friendly quality of insulation when they choose one.

You can learn about the places where ger dwellers buy building insulation from graph below.



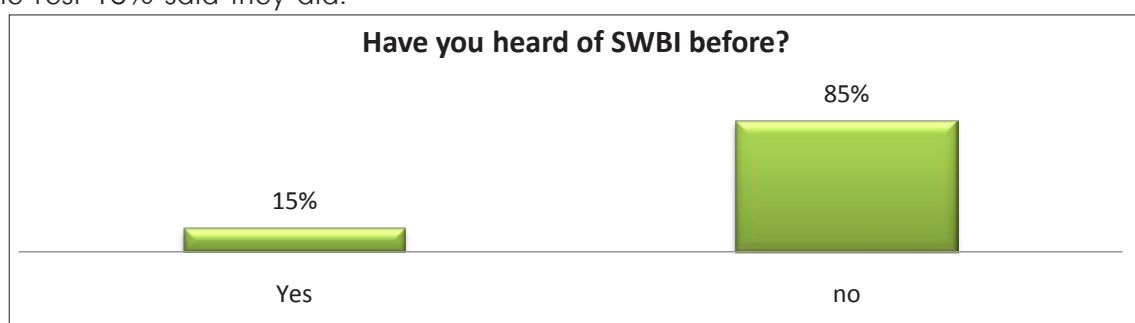
Graph 42. The sources of building insulation products for ger dwellers

The majority of respondents buy building insulation at the market. Those who chose “others” buy insulation from all three sources. Following table shows the percentage of respondents who buy building insulation at the markets mentioned below.

No	Market name	Percentage
1	100 ail	59.04%
2	Gurvaljin	16.87%
3	Khangai	8.43%
4	Tsaiz	9.64%
5	Narantuul	3.61%
6	44	2.41%
Total		100.00%

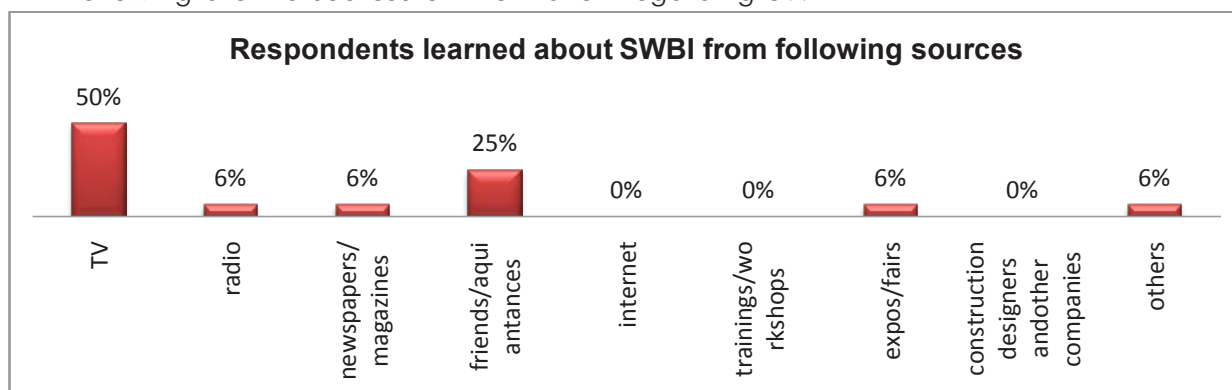
Table 18. Markets most visited by ger dwelling respondents

Most of building insulation trades happens at “100 ail” market with almost 60% of respondents visiting there. Crushing 85% of respondents admitted they never heard of SWBI, while rest 15% said they did.



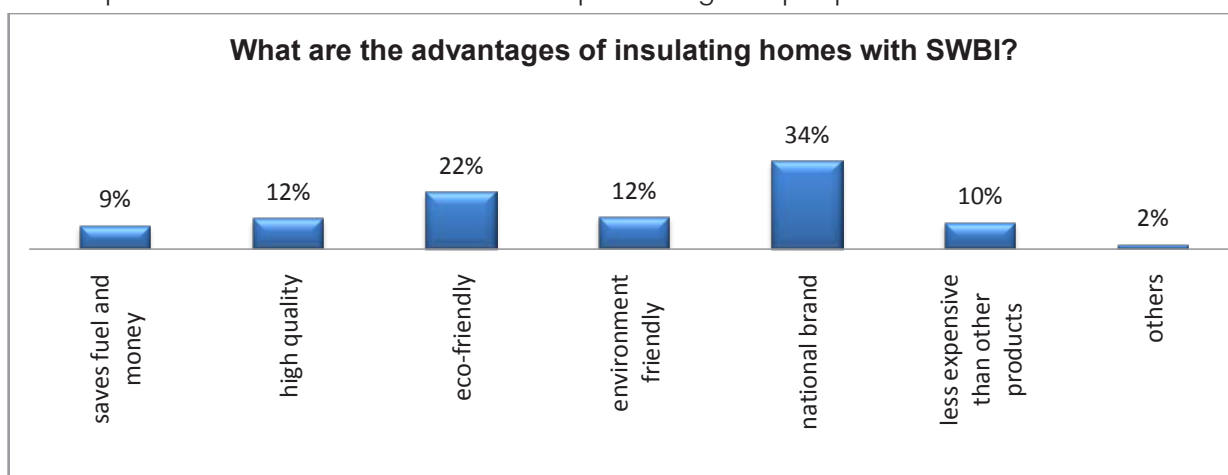
Graph 43. SWBI awareness rate among ger dwelling respondents

Following are the sources of information regarding SWBI.



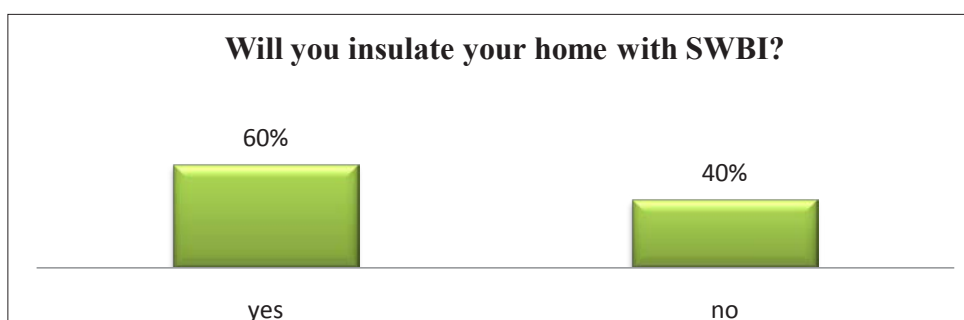
Graph 44. The sources of SWBI information for ger dwelling respondents

TV and rumors are the main sources of information for most of the respondents.
 Respondents' feedback of SWBI after presenting sample product:



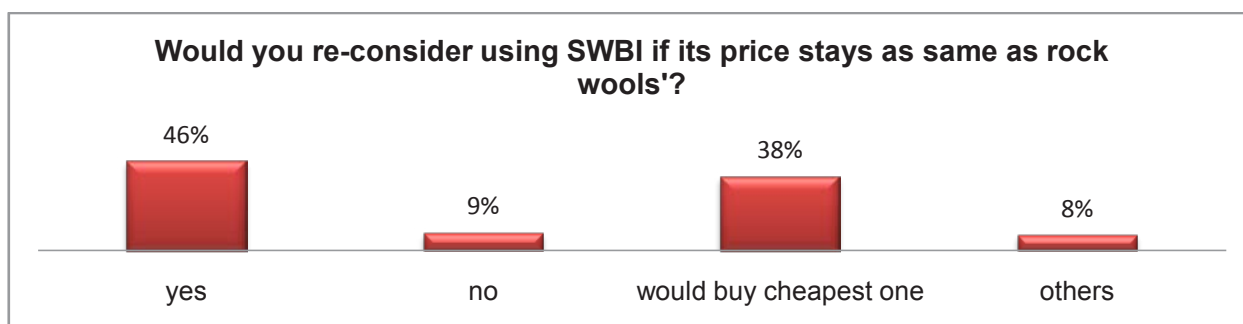
Graph 45. The advantages of insulating homes with SWBI, by ger dwellers' view

Those who favor SWBI make their decision apparently on the grounds of national brand and environmental friendliness. Therefore, promoting SWBI as environmental friendly national brand would be smart sales kickoff strategy. Also, 60% of total respondents who expressed their willingness to insulate their homes with SWBI made such decision on grounds of national brand with less risk to environment, low thermal conductivity and low cost. Those who ignored SWBI as an effective insulation solution named higher risk of pest and rodents' infestation, and unavailability of information regarding SWBI as the downside of the product.



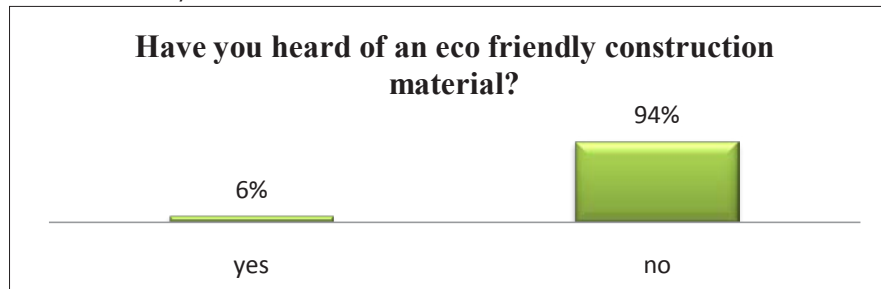
Graph 46. Ger dweller's willingness to insulate home with SWBI

Respondents who refused to use SWBI in home insulation were asked again if they would ever change their mind towards the use of SWBI when its price stays as same as rock wool's. Please refer to graph below for answers.



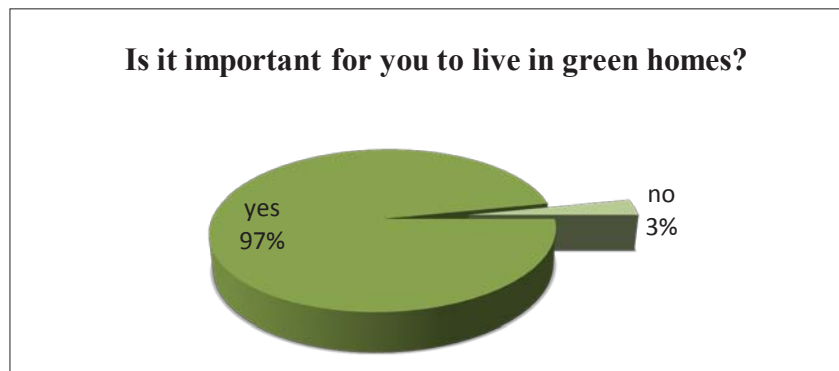
Graph 47. Probabililty of choosing SWBI over rook wool in given situation, by ger dwelling respondents

Though 84% admitted they would re-consider, it remains largely dependent on price. Therefore, charging higher price for SWBI than rock wool would be an extremely bad idea. As much as 94% of ger dwellers have never heard of green homes and green construction materials. Confusing green homes with regular wooden house was quite common amongst tiny 6% who admitted they heard.



Graph 48. Eco-friendly construction material awareness raet among ger dwellers

Peoples' attitude towards green homes and green construction material is very positive with almost 97% of ger dwellers involved in survey wanted to live in green homes.



Graph 49. Willingness to live in green homes, by ger dwellers

Due to low household income, the respondents lay more stress upon price and health safety aspects of an insulation, rather than environmental friendliness.

4.1.3. People living in apartments

The questionnaire for people living in modern apartments was consisted of questions designed to get information regarding building's thermal comfort for its occupants and thermal insulation of building, apartment dwellers' awareness of building insulation including SWBI, and their preference for construction material acquisition.

No	Districts	Number of People	percentage
1	BZD	12	16.90%
2	BGD	19	26.76%
3	SKhD	13	18.31%
4	KhUD	9	12.68%
5	ChD	8	11.27%
6	SBD	10	14.08%
7	Nalaikh		0.00%
Total		71	100.00%

Table 19. Number of respondents living in apartments per districts

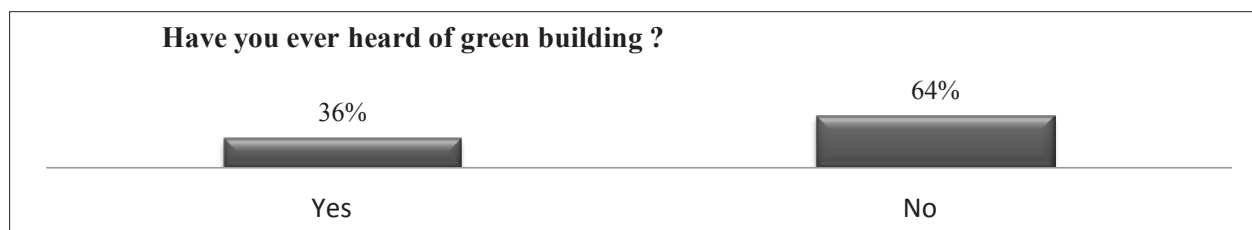
The locations of focus groups were selected in the areas of old apartments, including:

- Microdistrict#16 in Sansar, BZD district
- Bayangol district-3, 5, 6, 13 khoros in microdistrict#3, and microdistrict#10
- Songino-khairkhan district-3, 14, 15 khoros in microdistrict#1
- Khan-Uul district-1, 4, 5 khoros
- Sukhbaatar district-1, 2, 4 khoros
- Chingeltei district-6, 14, 17 khoros

The survey questionnaire was also filled by the staff of four Tenants' Associations, including:

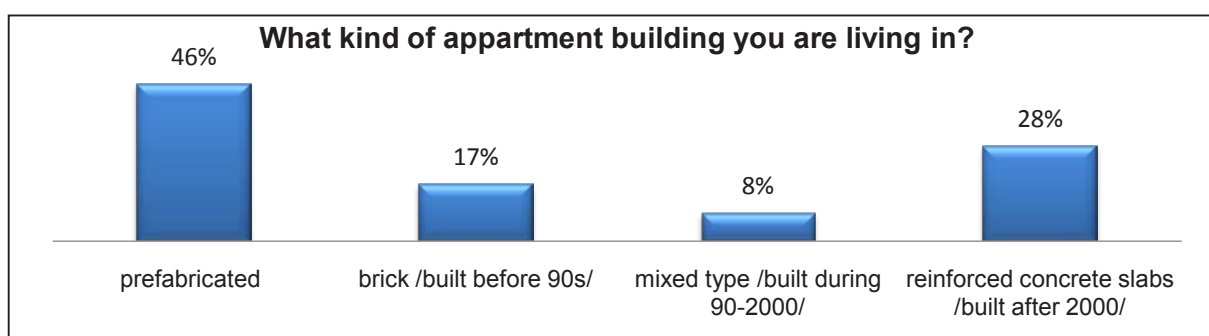
- NomtMurun at BGD-6 khoroo
- Naran-Orgil in microdistrict#1, SKHD
- Unur 20 in SKHD-16 khoroo
- Evseg 2 in CHD-14 khoroo

59% of total respondents living in apartments were male and 41% female. 64% of respondents have never heard of green building.



Graph 50. Awareness of green building among apartment dwellers

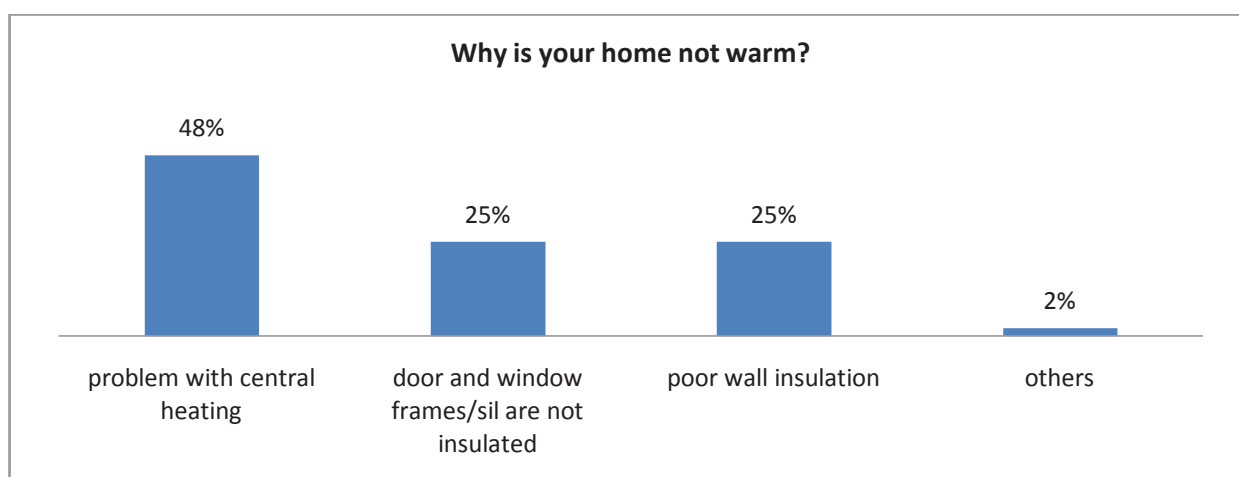
Refer to graph 51 for percentage of respondents, living in apartment buildings by type.



Graph 51. Construction types of apartments for respondent HHs

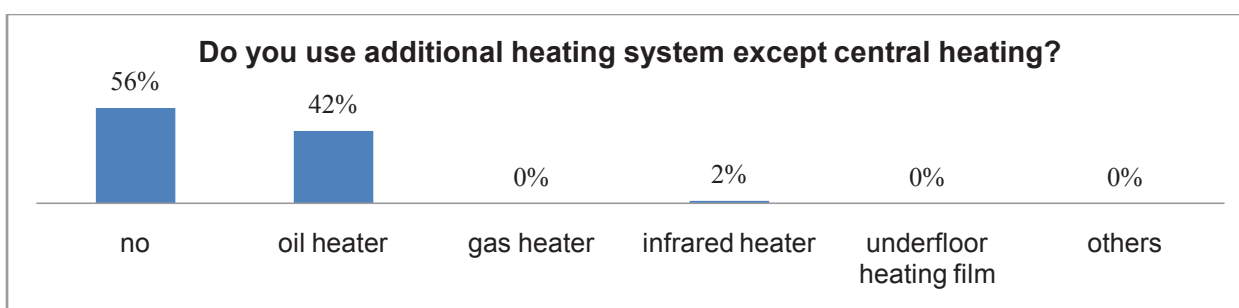
Figure 51 shows the majority of respondents are living in prefabricated old buildings and brick building, built before 90s, which gives the research team a chance to study thermal comfort for occupants and thermal insulation condition of old buildings. Nearly 63% of apartment dwellers don't know who regulates the heating of homes. Remaining respondents said house heating was regulated by AHPU, Power stations and TA.

59% of apartment dwelling respondents were found happy with the thermal comfort of their homes while 41% were not happy. The reasons why their homes are cold are given below.



Graph 52. Main reasons for apartments are cold

Apparently, 50% of apartment dwellers need additional insulation. On the other hand, some respondents use additional heating source to stay warm during winter.



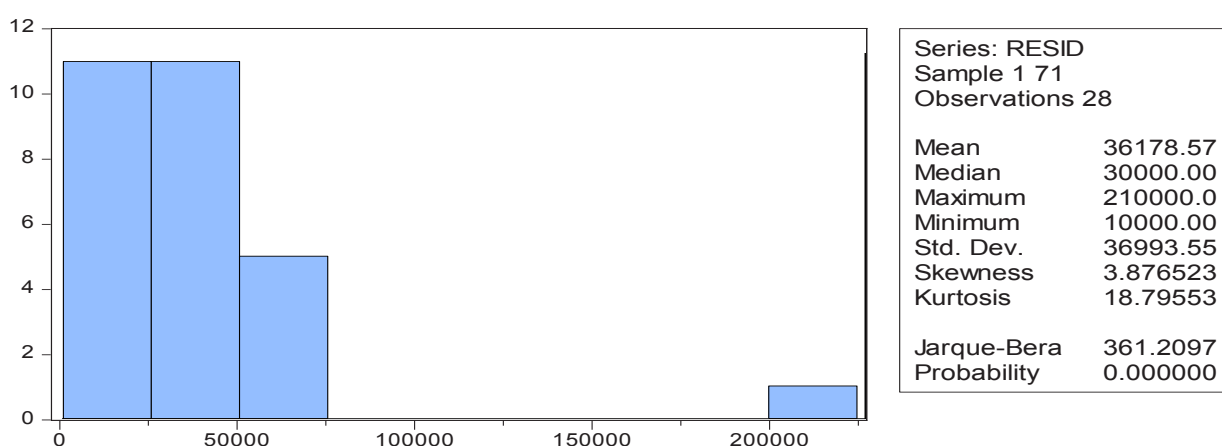
Graph 53. The use of additional heating sources in apartments

If no-users of additional heating system make up 56% of total respondents, 44% uses additional heaters indeed with almost 95.5% of them using oil heaters. The percentage of oil heater users is shown below by districts.

No	Districts	percentage
1	BZD	21.43%
2	BGD	32.14%
3	SKHD	10.71%
4	KHUD	7.14%
5	CHD	14.29%
6	SBD	14.29%
Total		100.00%

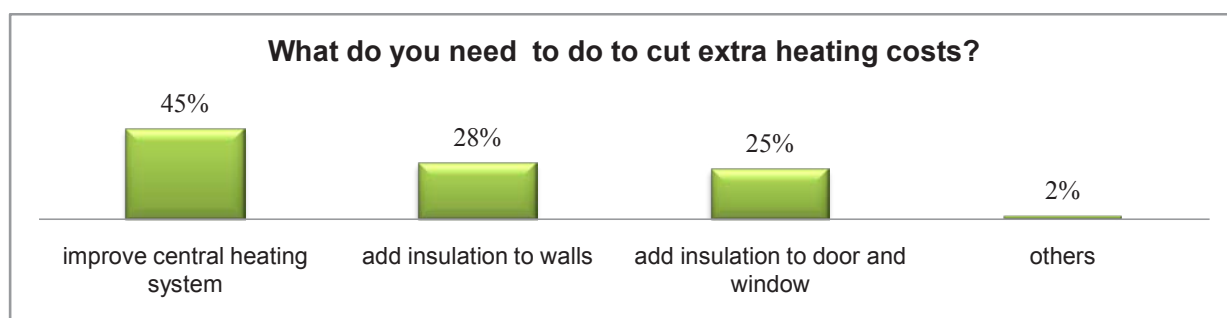
Table 20. The percentage of oil heater users per districts

An extra cost borne by use of additional heating system is calculated below.



Graph 54. Extra cost borne by use of additional heating system

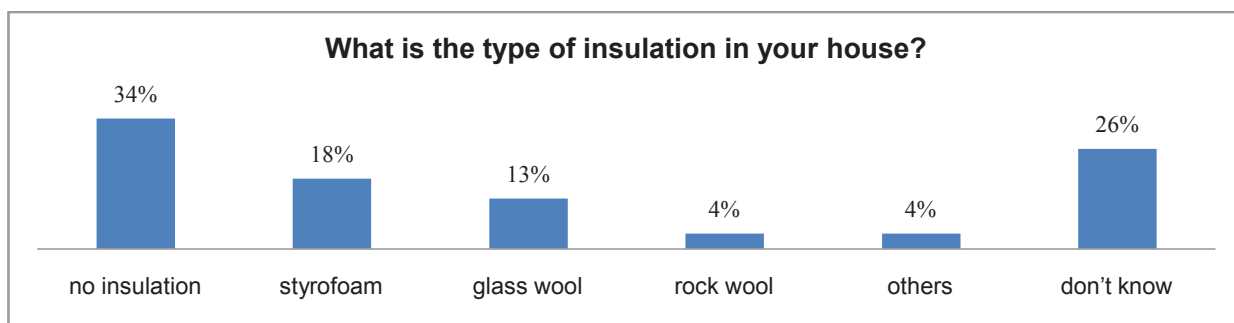
Let's take a look at other opportunities to reduce additional cost incurred by the use of extra heaters.



Graph 55. Opportunities to cut extra heating cost

The immediate need for additional insulation, which can be a SWBI, is seen among 28% respondents. An assumption, that the focus group can fairly represent majority of apartment dwellers, reveals a larger demand for additional insulation among as rough as 28% of total apartment dwellers in old microdistricts. Also, SWBI can be effectively used for insulation of apartment buildings, where that 45% who demanded central heating system improvement lives in. All these facts show there is a greater potential for SWBI in the town.

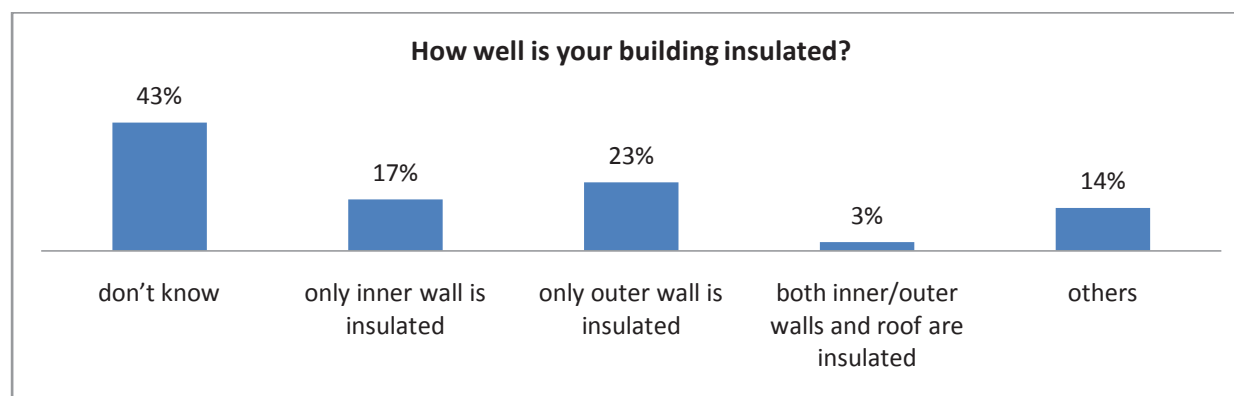
The types of insulation used in the apartment buildings, as reported by respondents are given below.



Graph 56. The types of insulation used in the apartment buildings

The apartment buildings where 34% of total respondents live need proper insulation. Again, 30% of those who didn't know if their buildings were insulated said their apartments were not warm enough, adding to number of apartment buildings that need additional insulation. Most common insulations used in apartment buildings are glass wool and Styrofoam, while rock wool, which is quite similar to SWBI in terms of price, takes meager 4%.

Information, regarding how well the apartment buildings are insulated is provided below.

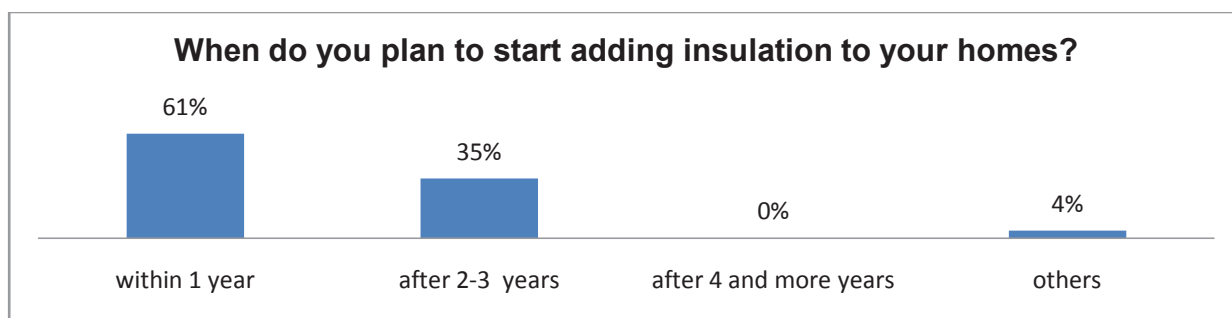


Graph 57. The places where the insulation is used in apartments

Though 43% of respondents know the building was insulated, but they don't know how and where it was insulated. 33% of them are women and 66% are men, which show the women are more concerned about the property issues than men are.

42% of those who live in non-insulated apartments admit they were not sure if the building needs to be insulated, another 25% think it needs to be insulated, while rest 33% think it needn't to be insulated. So, the homes of 25% of respondents who live in non-insulated homes need proper insulation indeed. 40% of those who still hesitate, and 31% of those who don't need homes insulated, admitted they are happy with thermal comfort of their homes. All above facts lead to a conclusion that 69% of the respondents who don't need homes insulated and 60% of those who are still hesitant actually live in cold houses.

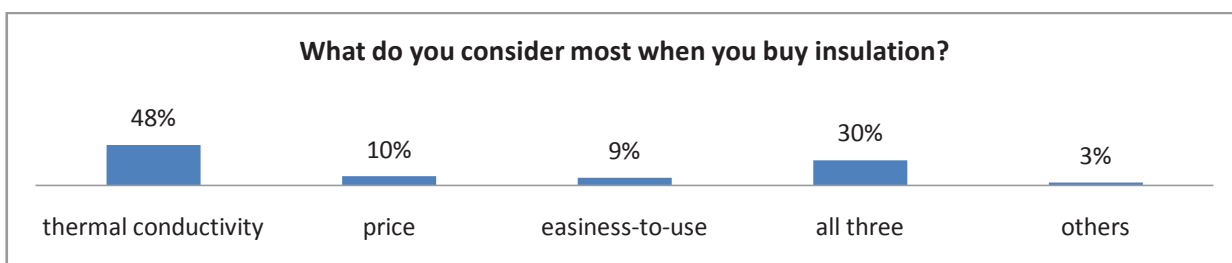
The respondents who are planning to add insulation to their homes want to realize their plan within periods mentioned in below graph.



Graph 58. The plan for adding insulation, by apartment dwellers

Majority of respondents want to start home insulation as soon as possible, while fewer of them needs some time to start.

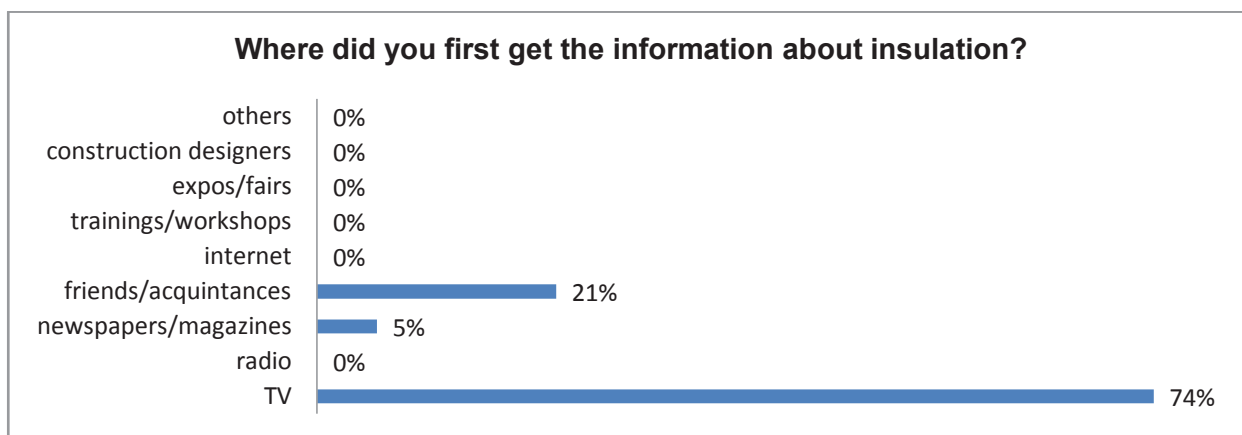
Top priority for half of the apartment dwelling respondents is the thermal conductivity of the insulation, however, majority of them consider price, thermal conductivity and easiness-to-use before choosing insulation. Apparently, thermal conductivity of insulation is the top priority for apartment dwelling respondents.



Graph 59. Apartment dwellers' main consideration when buying insulation

56% of those who consider thermal conductivity of insulation is the most important part, are men. 60% of the respondents who named price, thermal conductivity and easiness-to-use as most important factors are also men.

75% of apartment dwelling respondents admitted that they haven't heard about insulation before. Most of those who admitted they heard got the information from friends and acquaintances.



Graph 60. Sources of insulation information among apartment dwelling respondents

Apparently, TV and rumors by friends and acquaintances are the major sources of information regarding insulation.

4.2. Business entities

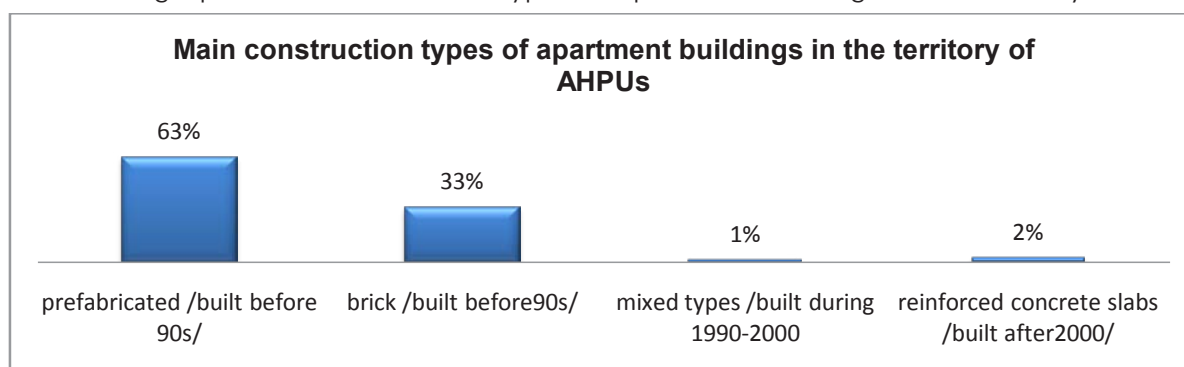
4.2.1. Administration of Housing and public utilities

8 Administrations of Housing and public utilities, that provide service to 22,036 households living in 493 apartment buildings on 21 khoroos of 6 districts of Ulaanbaatar city, completed market research survey.

No	Districts	Number of AHPUs
1	BZD	2
2	BGD	1
3	SKHD	2
4	KHUD	1
5	CHD	1
6	SBD	1
Total		8

Table 21. Number of Administrations of Housing and Public Utilities per districts

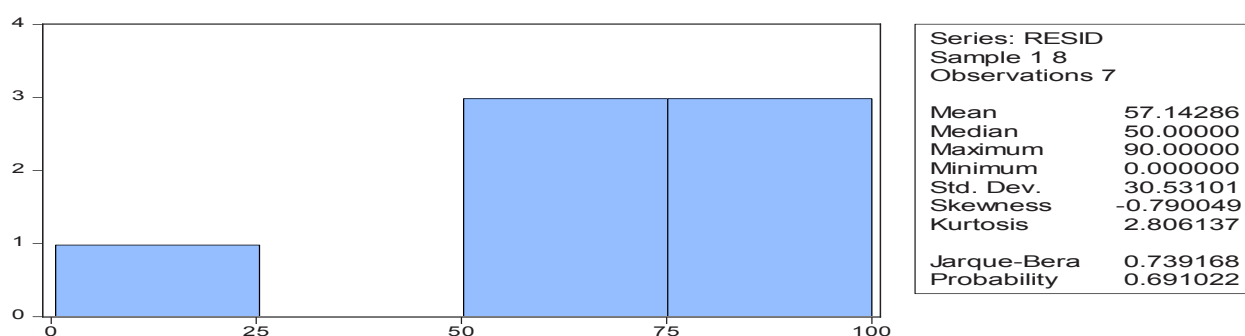
Refer to graph below for common types of apartment buildings on the territory of AHPUs.



Graph 61. Construction types of residential buildings in the service area of AHPUs

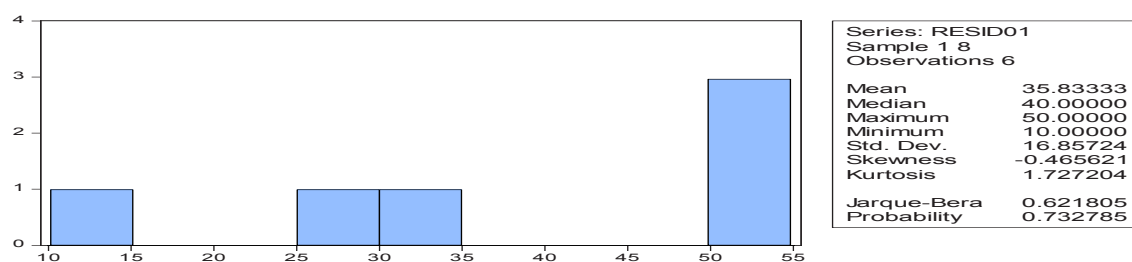
Prefabricated and brick buildings built before 90s dominate the territories of selected AHPUs, as the main criteria for selection of survey sites was the area with old apartment buildings.

The temperature histograms of hot water provided by AHPUs are shown below.



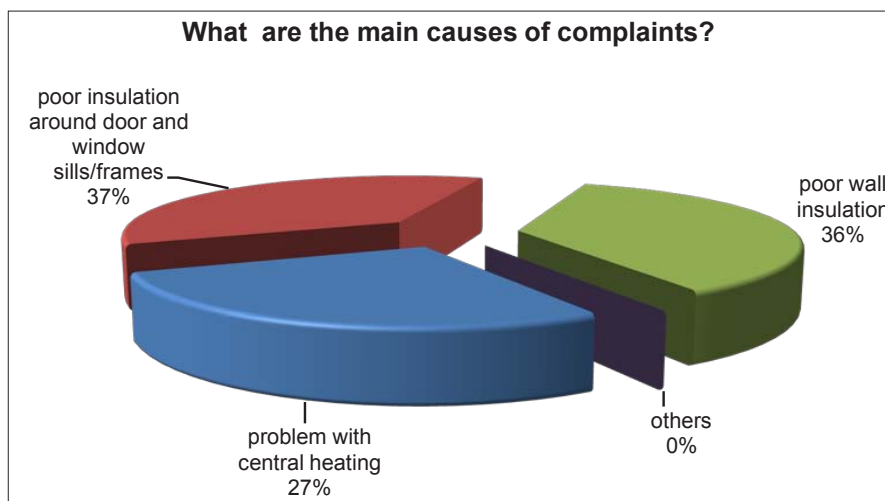
Graph 62. The temperature histograms of hot waters provided by AHPUs

Below is how the histograms of complaints from households in service areas look like.



Graph 63. The histograms of complaints from households in service areas

The in-depth study of complaints by AHPUs revealed following causes.

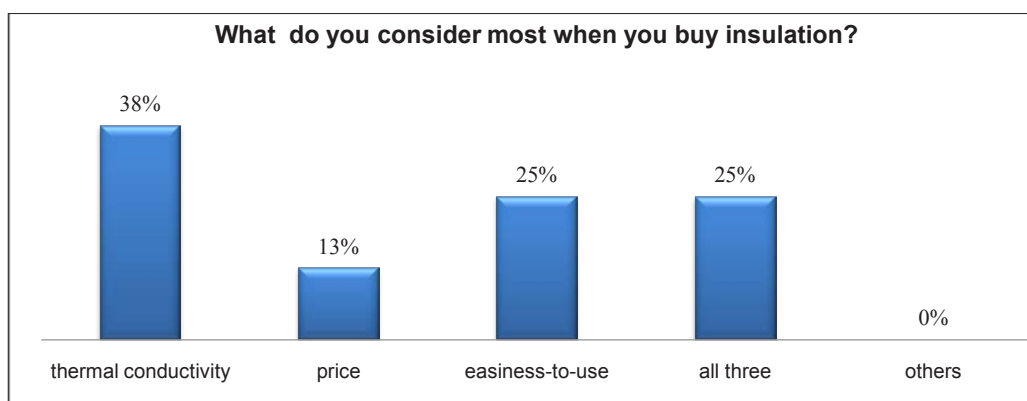


Graph 64. The natures of complaints from HHs

As much as 71% of respondents admitted they use additional heating system like oil heater in order to keep the home warm.

AHPUs acknowledged almost half of the apartment buildings in their service area lack proper insulation. Glass wool and Styrofoam are equally used as insulation in the other half of the buildings in their service area. 83% of AHPUs in the survey acknowledged that the tenants who live in non-insulated buildings constantly complain about how cold it is inside their homes during winter. "AHPUs will not be held accountable for homes being cold during winter", expressed by 67% of AHPUs in the survey, while 17% of them said they would eradicate the problem in 2-3 years time. No response was given by rest 16%.

Following are the AHPUs' top priorities for the purchase of insulation.



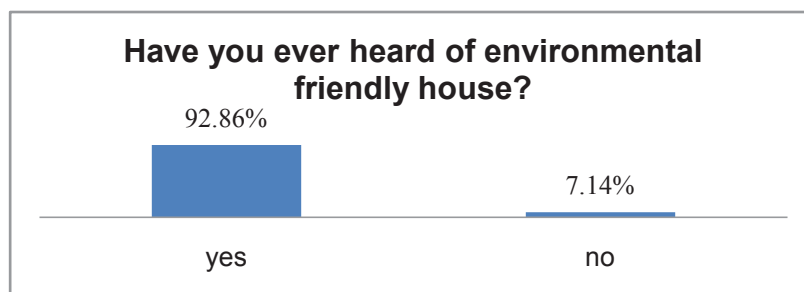
Graph 65. AHPUs' top priorities for the purchase of insulation

86% of respondents have never heard of SWBI. TV and radio were the source of information regarding SWBI for the rest.

4.2.2. Construction designing entities

7 construction designing entities in Ulaanbaatar city, 4 in Darkhan and another 4 entities in Erdenet, collectively as “construction designers” completed market research survey.

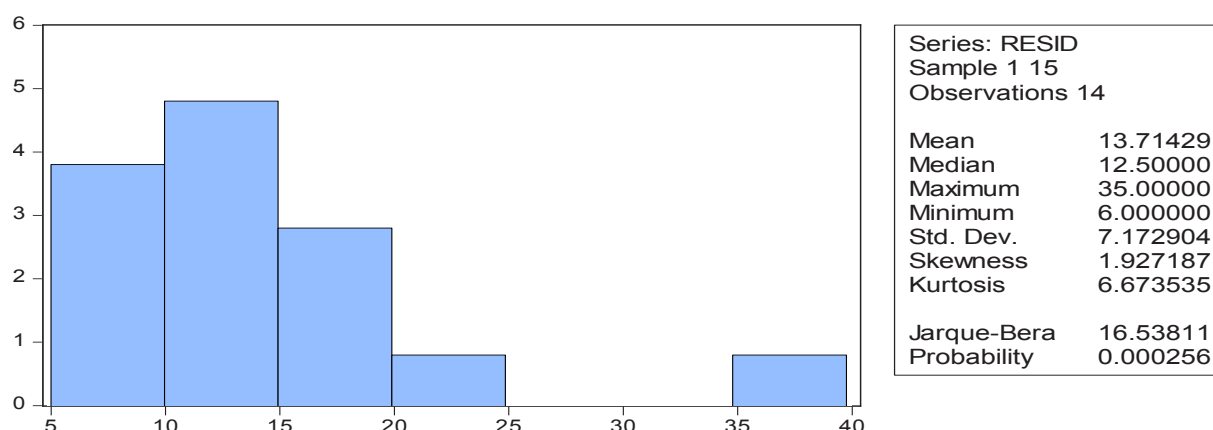
Most of the construction designers heard of environmental friendly house and technology. Refer to graph below for details.



Graph 66. Awareness rate of environmental friendly house among construction designers

Those who answered yes, named passive house, green home, Canadian house, straw-bale construction, eco panel and thermal block as environmental friendly house and construction materials.

The number of construction designs developed by the respondent entities is shown below.



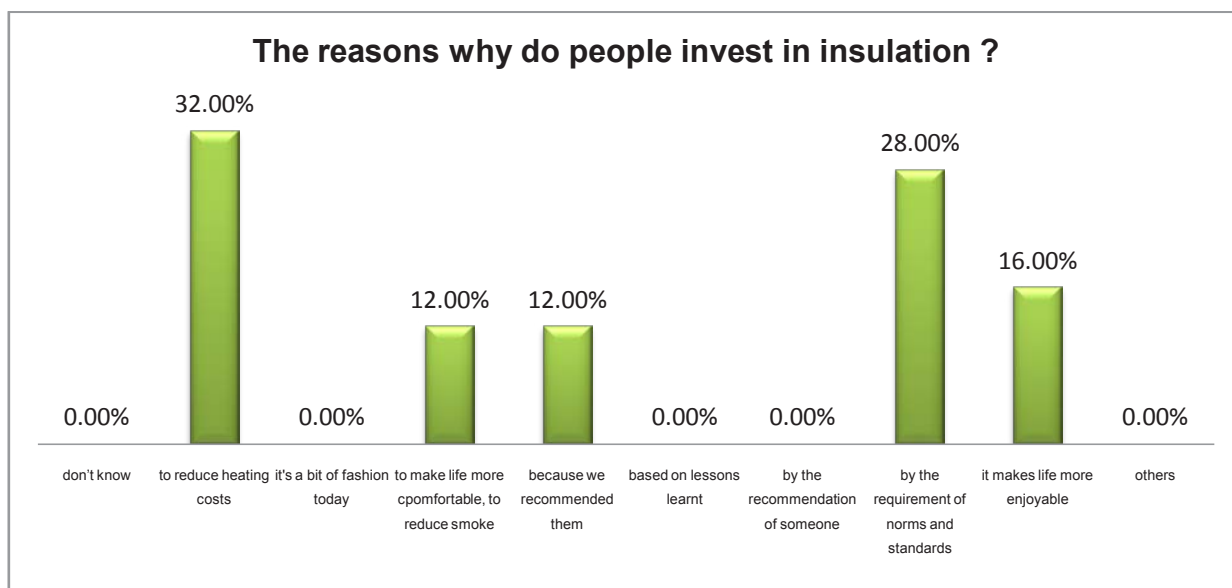
Graph 67. The number of construction designs developed by the respondent entities

Every house design has insulation plans, vowed by all respondent entities. Except for some constructions that don't really need insulation due their specific purpose, all buildings and houses for residential, service and industrial purposes need insulation.

6.7% of total respondent entities highlighted the importance of proper insulation of basic wooden detached house, while another 13.3% highlighted brick building as the main object for insulation. However, the respondents who underlined the importance of thorough insulation of all houses and buildings regardless of the type, space and purpose of buildings (except for those that don't need insulation), make up cruching 80% of total respondent entities.

Nearly 79% of all respondents underlined the equal need for insulation of all buildings and houses in both rural and urban centers.

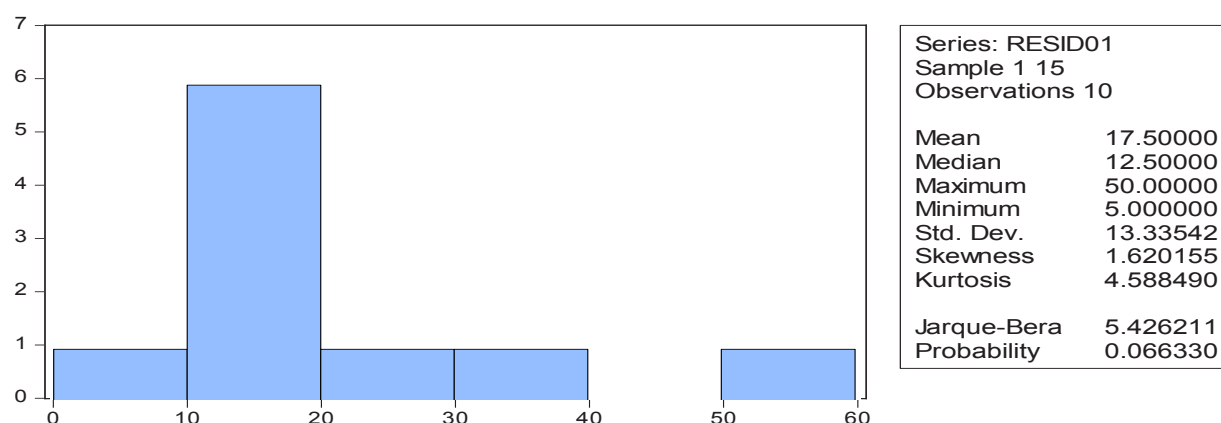
The reasons for investing in insulation were identified in the graph below.



Graph 68. Top reasons for investing in insulation, by construction designers

The main reasons why people invest in insulation are to reduce heating costs, construction norms and standards, and to make own life more comfortable. One very interesting point we observed here is entire 12% of organizations/people who requested building designs agreed to add additional costs for insulation just by the recommendation of construction designers. This suggests a close cooperation with construction designers for increased sale of SWBI.

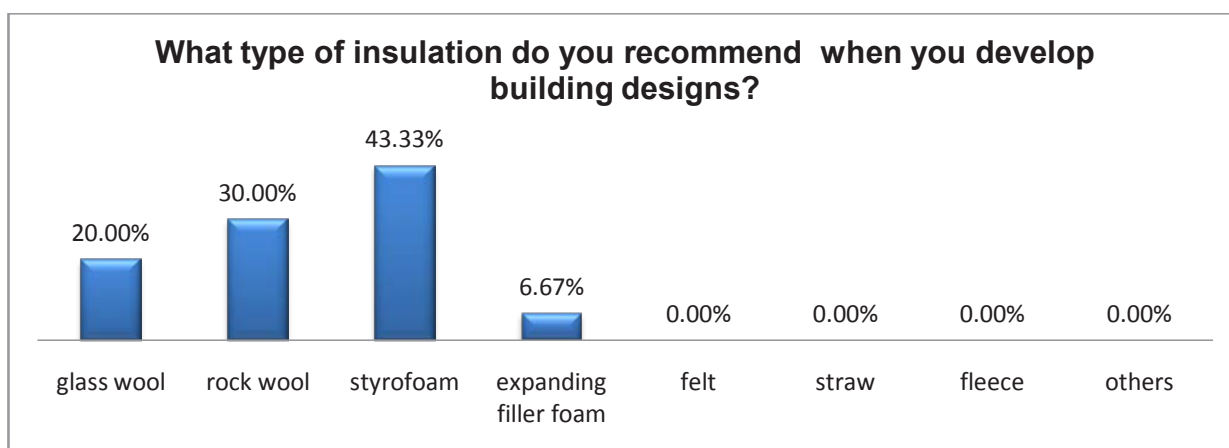
The price difference between insulated and non-insulated buildings has been studied in the survey respondent entities, and the histograms of results are shown below.



Graph 69. Histogram of price difference between insulated and non-insulated buildings

The minimum and maximum price differences between insulated and non-insulated houses were reported at 5% and 50%, averaging 17%. The percentages of price difference fluctuating between 10-20% have been outlined by 6 construction design developing companies/respondents.

The types of insulation recommended by the construction designers are listed below.

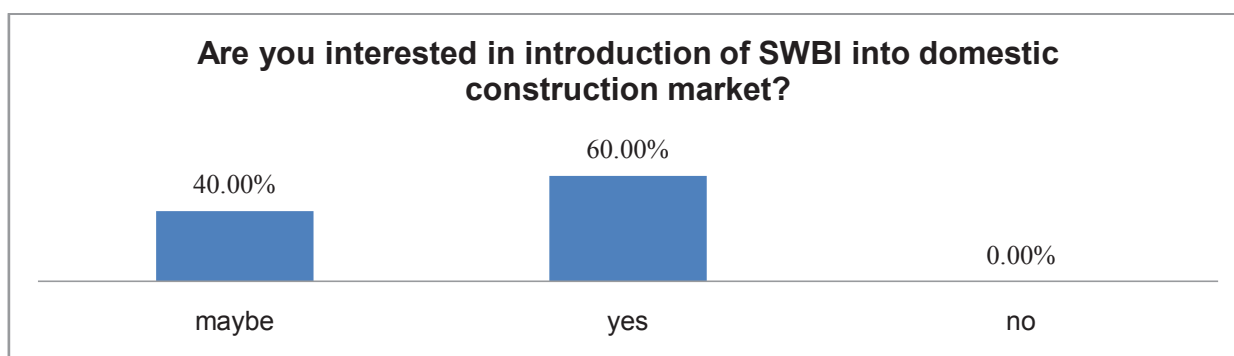


Graph 70. Main types of insulation recommended by the construction designers

The most commonly used/recommended insulation types are Styrofoam, rock wool and glass wool, with 93% of respondent entities recommend only these three types. The most widely used insulation type is Styrofoam.

Immediate 73.33% of respondents entities admitted they never heard of SWBI, and colossal 93.3% of them were found unaware of anyone who insulated houses/buildings with SWBI.

The degree of willingness of construction designers to introduce new insulation-SWBI into domestic construction market is shown below.



Graph 71. The degree of willingness among construction designers to introduce SWBI

Those who hesitated to give direct answer did that on grounds of following concerns:

- It takes time for new technology to prove its worthiness
- Cost efficiency of SWBI is not clear
- Price is the top factor for majority of consumers. SWBI specifications' conformity to national construction standard is not clear
- Higher cost and price of SWBI

Those who answered yes did that on grounds of following assumptions:

- Product from renewable agricultural resources
- Eco-friendly domestic product
- Reduces energy consumption within building
- Environmental and health friendly product
- SWBI specifications must meet MNS
- Reliable supply of raw materials
- Domestic production needs to supported

80% of construction design developer respondents consider that living houses should be designed by professional construction design developing entities, while rest 20% opt out of such requirement.

Followings were raised as potential marketing mechanism for SWBI, by respondent entities:

- Start testing and public awareness activities
- To demonstrate SWBI applications, maybe on Canadian house technology
- To release TV commercials, develop technology and introduce know-how
- To update national building regulations with SWBI application
- To advertize SWBI through mass media
- To fix reasonable price to SWBI
- Quality issues
 1. Higher energy efficiency
 2. Higher fire resistance
- To promote as national brand product in full conformity with standards and norms
- To demonstrate low thermal conductivity of SWBI
- National brand product
- To demonstrate versatile applications of SWBI, to organize on-site trainings
- To release TV commercial
- To develop national standard for SWBI, to have fire resistance assessment on SWBI
- To raise SWBI awareness of construction designers and construction companies, to organize SWBI introduction workshops to respective stakeholders

Respondent entities identified potential bottlenecks in the marketing of SWBI as below:

- Undetermined raw material supply.
- Low economic benefits
- Quality and durability issues remain unclear; raw material reserve
- Pricing; no tangible technology and standards developed yet; no logistics system
- To promote comparative advantages of SWBI over other insulations
- Delivery costs/logistics
- Desiccant needs to be installed with SWBI
- SWBI has low fire resistance
- Needs to install pest and rodent repellents, foul odor
- SWBI releases foul odor, requires longer and laborious installation, should be kept apart from water and moisture
- Product may rot under extended contact with water
- There is no national standard for SWBI approved, thus is cant be recommended by design developers; fire resistance of SWBI is not as good as rock wool's
- Product can't be well accepted by consumers unless manufactured in the form of firm plates rather than flexible rolls; use price and quality as a flagship

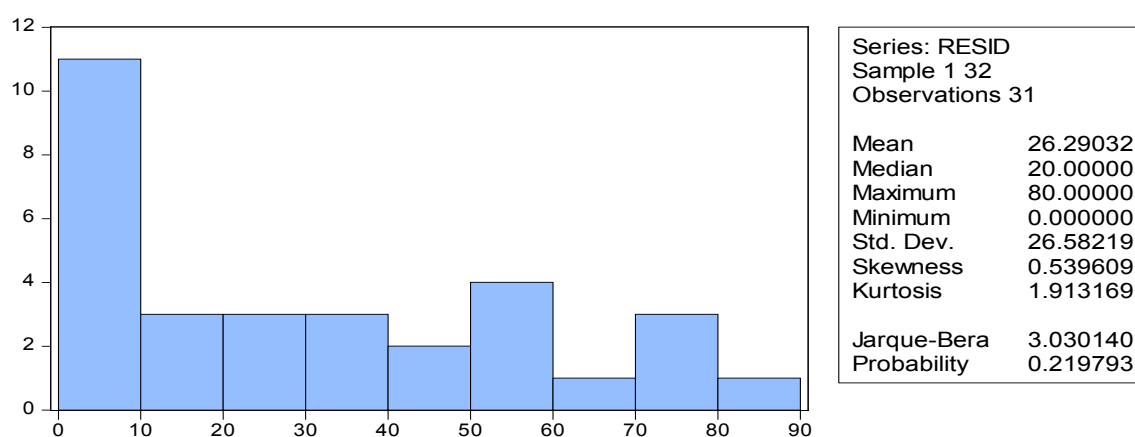
4.2.3. Construction material retailers

Total of 32 retailers of building materials, including tradesmen and business entities, in Ulaanbaatar, Darkhan and Erdenet cities completed market research survey. The survey questionnaires were filled by tradesmen at “100 ail”, “Gurvaljin” building material markets in Ulaanbaatar; 4 business entities and 5 tradesmen from “Hash Od” center, “Od” center and “Altan san” construction markets in Darkhan; “Bars” building material store, and 7 other tradesmen from “Khangal” building material market.

No	Location	No of respondents
1	SKHD, UB	8
2	SBD, UB	7
3	Darkhan city	9
4	Erdenet city	8
Total		32

Table 22. Number of building material retailers by location

The study of respondents' sales of building materials directed to big entities and companies shows following results.



Graph 72. The sales volume of materials directed to big entities

Sample: 1 32

Included observations: 32

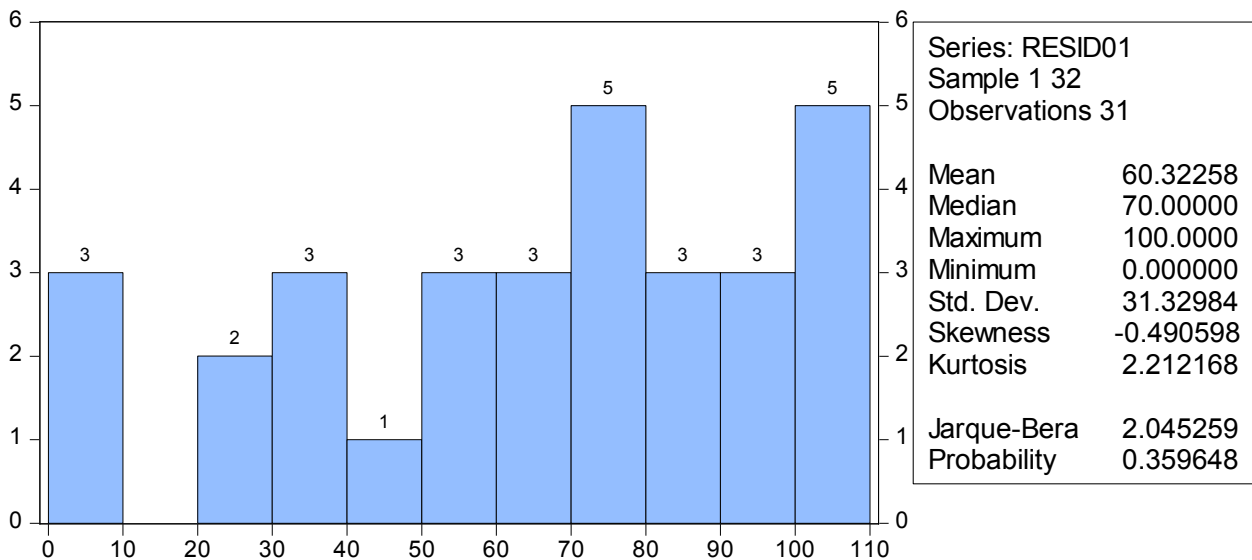
Number of categories: 11

Value	Count	Percent	Cumulative Count	Cumulative Percent
NA	1	3.125	1	3.125
0	11	34.375	12	37.5
10	3	9.375	15	46.875
20	3	9.375	18	56.25
30	3	9.375	21	65.625
40	2	6.25	23	71.875
50	3	9.375	26	81.25
55	1	3.125	27	84.375
60	1	3.125	28	87.5
70	3	9.375	31	96.875
80	1	3.125	32	100
Total	32	100	32	100

Table 23. The sales volume per buyers

Graph 72 shows, a meager 10% of total trades by 11 retailer respondents, including tradesmen and entities, was done with bigger construction companies. Basically, retailer respondents' transactions with bigger construction companies accounts for an average of 26% of their total trades. This leads to a conclusion that the main buyers for small retailers are not big construction companies.

The percentage of retailers' transactions with bigger construction companies looks like below.



Graph 73. The percentage of retailers' transactions with bigger construction companies

The transactions with individuals account for an average of 60% of total trades by respondent retailers, with minimum and maximum figures being 10% and 100% per retailer.

Let's calculate the percentage of transactions with individuals.

Sample: 1 32

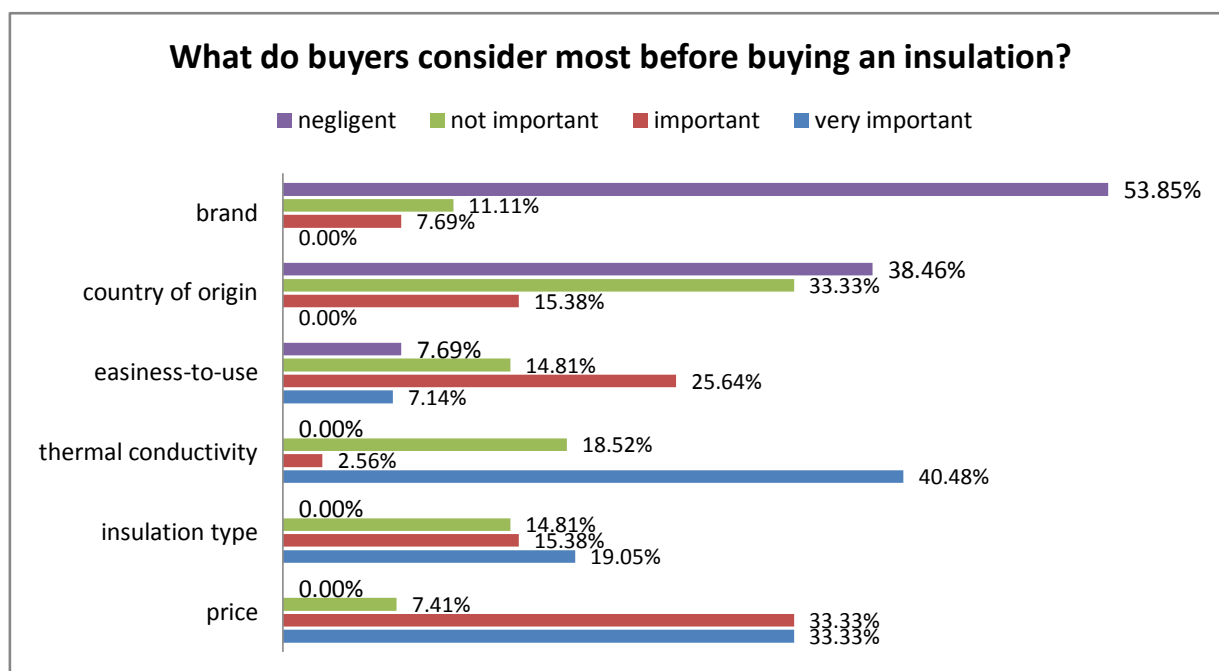
Included observations: 32

Number of categories: 13

Value	Count	Percent	Cumulative Count	Cumulative Percent
NA	1	3.13	1	3.13
0	3	9.38	4	12.50
20	1	3.13	5	15.63
25	1	3.13	6	18.75
30	3	9.38	9	28.13
40	1	3.13	10	31.25
50	3	9.38	13	40.63
60	2	6.25	15	46.88
65	1	3.13	16	50.00
70	5	15.63	21	65.63
80	3	9.38	24	75.00
90	3	9.38	27	84.38
100	5	15.63	32	100.00
Total	32	100.00	32	100.00

Table 24. The percentage of transactions with individuals

The results verifies the fact that most retailers do trade with individuals, meaning larger construction companies don't go to retailers' shops or construction materials markets for insulation.



Graph 74. Consumers' top priorities when buying insulation, by retailers' view

The buyers at the retailers' shops and markets buy products after considering factors listed below.

Thermal conductivity specification is the top factor that has strongest influence on consumers' insulation selection. 40% of buyers highlighted the thermal conductivity of insulation as most important, followed by price with 33% and insulation type with 19%. The price of insulation also plays second important role in consumers' determination of which products to choose.

Price is the most important for some 40% of respondent, while remaining chose quality during comparative survey.

37% of retailers admitted they have heard of eco-friendly/green home, however, their knowledge was limited to Canadian house and other building materials made of eco-friendly raw materials.

Only 30% retailer respondents heard of SWBI, and they have following assumptions regarding SWBI:

- Cheap product from domestic production
- Fleece is a material with low thermal conductivity
- Eco-friendly product, but need more information and specification, such as durability, vulnerability to insect attack, etc
- Needs more information about comparative advantages over other types of insulation
- Health friendly, domestically produced, easy-to-use and safe
- Product's thermal insulation performance should be high
- Can be easily installed between wood studworks
- Can be used as acoustic and thermal insulation

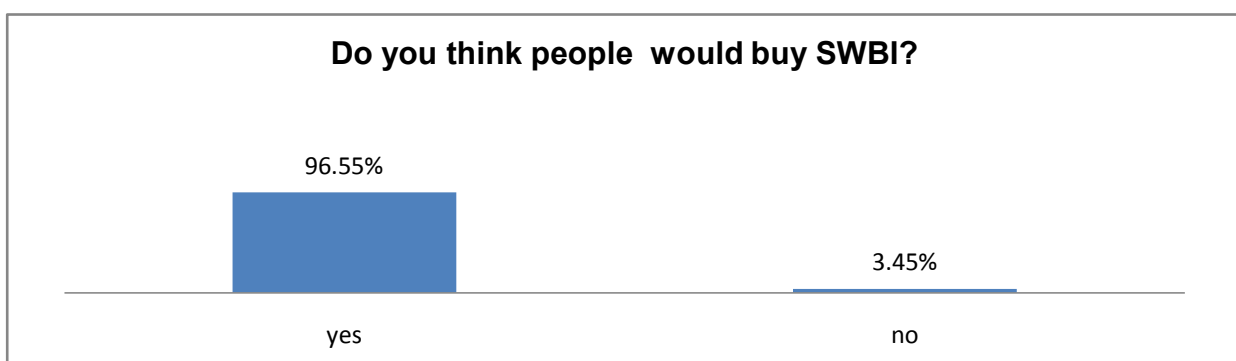
- Fire resistance is low
- May attract insects and rodents, may release foul odors
- It can't be rodent proof, not easy to use

As much as 93% of retailers expressed their willingness to sell SWBI. They are ready to sell if SWBI possess following qualifications and advantages:

- Low cost product with higher profit
- Eco-friendly product
- Domestic production
- Low cost product
- High quality product with higher profit
- would soon be recognized by consumers
- it has many advantages and consumers would like it
- it might be better than glass wool
- excellent quality
- not expensive
- many buyers want to have this product
- new product with technology developed on traditional felt making technology
- the piloting of product would show positive results
- typical net from product's sales for retailer is 10-15%, is acceptable
- high quality, durable, and resistant to fire
- soon there would be a national standard for the product
- if product begins to attract consumers

On the contrary, there is 7% who refused an offer to sell SWBI with anticipation that there wouldn't be many buyers of SWBI because of high price and weak awareness.

When asked about consumers' intention to buy SWBI, very positive intention was assured by almost 96.55% of respondents.



Graph 75. Probability of consumers' selection of SWBI, by retailers' view

The comments and suggestions made in regard to SWBI, by retailer respondents who anticipated positive buyer's intention include;

- Domestic product, less transportation cost
- Eco-friendly, domestic product
- Needs more promotion
- Consumers would buy it if quality and performance of SWBI exceed that of glass wool
- If the quality is good

- Domestic product with low thermal conductivity, extended durability, health friendly and high quality (if quality is excellent, people will buy it notwithstanding high price)
- Excellent product's safety and hygiene
- Don't know
- Consumers are more concerned about quality
- Heat capacity
- It depends on price (cheaper means more buyers)
- People are increasingly concerned about health friendly products
- Excellent performance means more buyers
- High quality will attract more customers eventually creating bigger demand
- Import substitute domestic product
- People buy SWBI because they know low heat transfer coefficient of fleece, and they would support domestic production

Higher level of product's uncertainty associated with multiple risk factors are the factors limiting the marketability of SWBI, for some 3.45% of respondents.

Following are some of the marketing strategies for new SWBI, suggested by retailer respondents:

- To release more TV commercials in order to attract wholesalers and retailers
- To raise public awareness of SWBI, to demonstrate versatile applications of SWBI
- To raise construction companies' awareness of SWBI
- To raise SWBI awareness among rural consumers
- To demonstrate applications: thermal insulation of pipelines, application for homes, etc
- Needs to demonstrate various applications of SWBI, to implement various promotional methods
- Reasonable pricing, high quality and diversity of products
- To demonstrate advantages
- To promote as national brand
- To place promotional materials at big markets that are visited by rural consumers
- To carry out extensive public awareness raising activities using mass media (like Canadian house)
- To design proper labeling and packaging
- To avoid exaggerating product's performance
- To demonstrate product's applications, it should be of high quality and less irritating than glass wool
- To release TV and newspaper advertisement before putting into the market
- The impression and satisfaction of first buyers decide the future of product
- To focus on quality of product and promotional materials, TV commercials
- Product should be safe for human health and of high quality
- To pick good retailing and wholesaling points, to train retailers,
- Sales points correctly select and train good people and advertise

Price range of insulation products

Below table shows the sales price of ranges of insulation products at the domestic market

№	Manufacturing country	Glass wool thickness \cm\	Price per m ² (in MNT)	
			max	min
1	Russia	2	4000	
		4	3472	7465
2	China	2	890	1042
		3	1041	1389
		5	1538	5000
3	Mongolia	3	1500	3500
		4	2000	4500
		5	2250	6500
		10	3000	7500
4	USA	5	3667	
5	Germany	10	55833	

Table 25. The sales price ranges of glass wools (different brands)

№	Manufacturing country	Styrofoam thickness \cm\	Price per m ² (in MNT)	
			max	max
1	Mongolia	3	1500	3500
		4	2000	4500
		5	2250	6500
		10	3000	7500

Table 26. The sales price ranges of Styrofoam

№	Manufacturing country	Stone wool thickness \cm\	Price per m ² (in MNT)	
			max	max
1	Russia	5	3250	5650
		10	14900	
2	China	5	4167	5560
3	Mongolia	5	9100	9167

Table 27. The sales price ranges of stone wool (different brand)

4.2.4. Construction Company

The consumption of building materials, total output and SWBI awareness of companies that carry out construction and assembly works were surveyed.

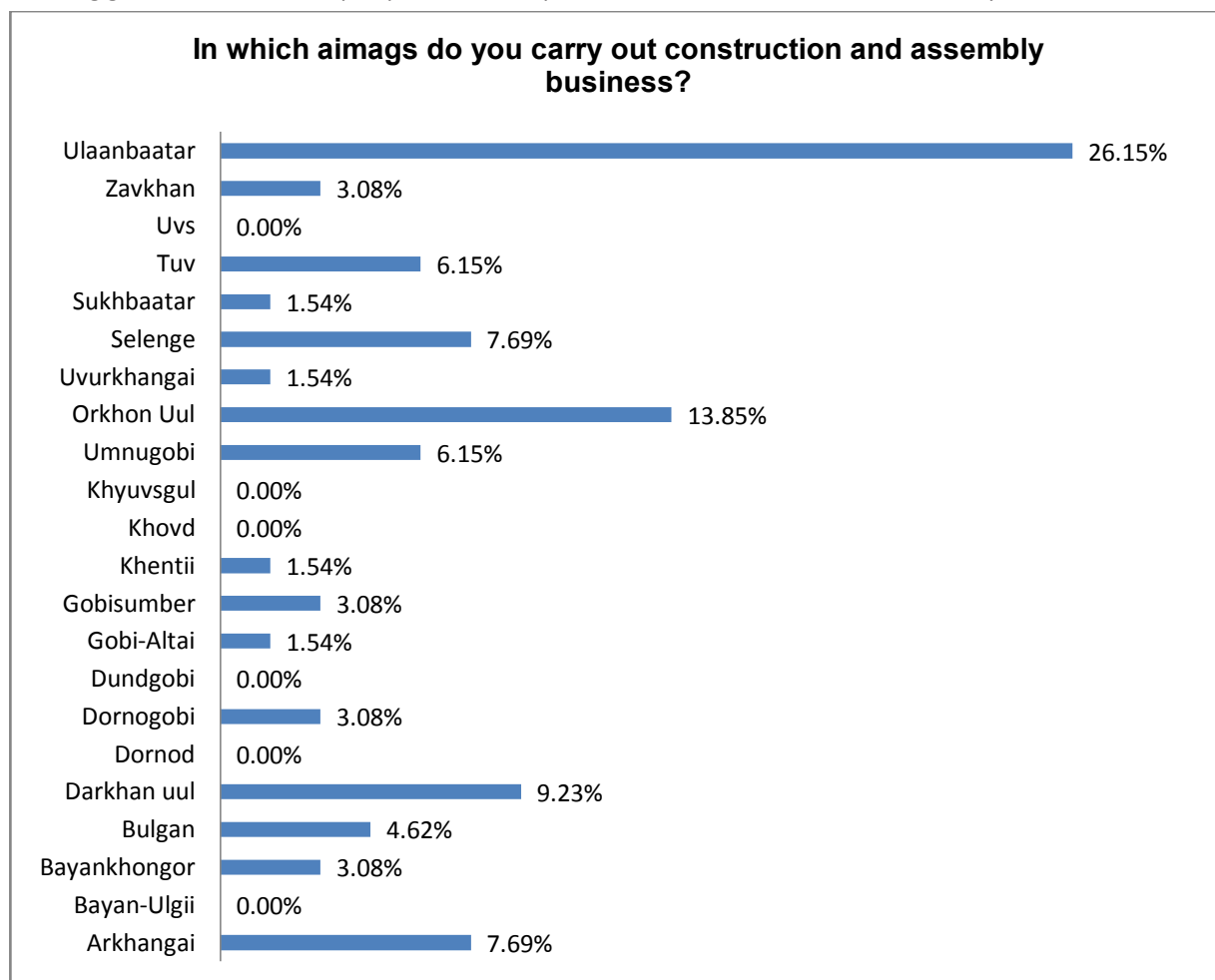
Total of 26 companies included in the survey.

No	Location of companies	Number of companies
1	BZD in UB	2
2	CHD in UB	5
3	SBD in UB	7
4	Darkhan	5
5	Erdenet	5
6	Arkhangai	2
Total		26

Table 28. Number of respondent construction companies per locations

54% of respondent companies are found in Ulaanbaatar. Darkhan and Erdenet have equal number of 5 companies each or 19% of total respondents. 7% of total respondents are located in Arkhangaimag.

Biggest construction projects are implemented in Ulaanbaatar, survey reveals.



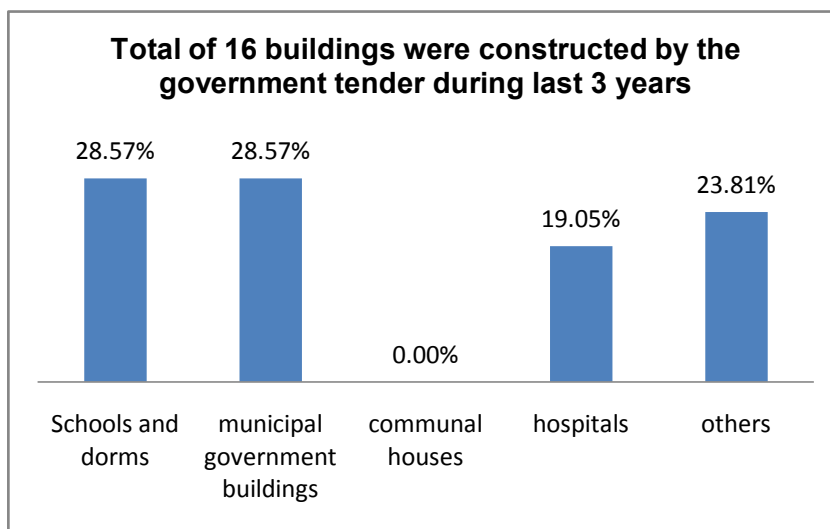
Graph 76. The percentage of total construction and assembly activities are carried out by respondent entities per areas

The percentage of buildings constructed by companies (by the principal place of business) shown below.

No	Principal place of business of the companies	Percentage intotal buildings constructed by respondent companies
1	Ulaanbaatar	63.08%
2	Erdenet	16.92%
3	Darkhan	15.38%
4	Arkhangai	4.62%
	Total	100.00%

Table 29. The percentage of buildings completed by respondent companies per area

Ulaanbaatar appears to be the busiest construction site in Mongolia, revealed by the fact that almost 63% of total buildings completed by respondents,were constructed in Ulaanbaatar aloneby companies from the same city.

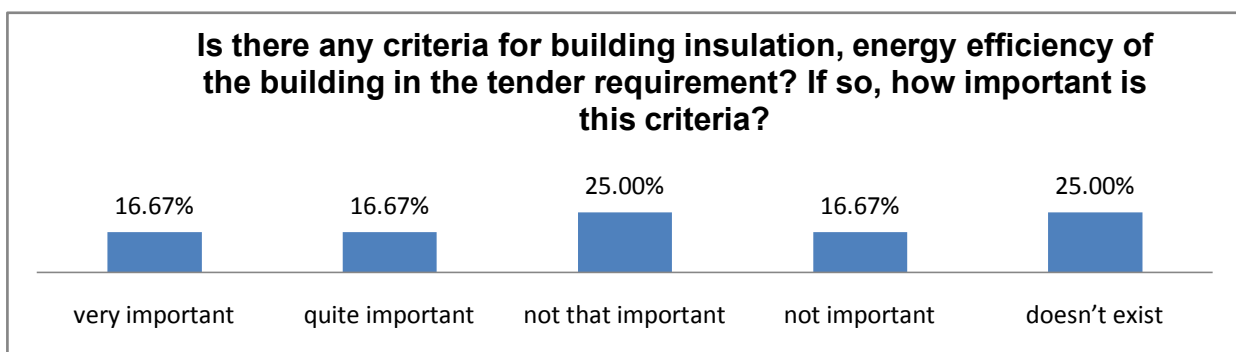


Graph 77. Buildings constructed by respondents under government tender

Only 38% of total respondent companies were ever awarded with government tender for construction of public services buildings. Below graph shows the types of public service buildings constructed during last three years by respondent companies.

The types of buildings shown in graph above suggest that government tends to invest heavily into construction of education and health facilities, and facilities for public services.

Does government impose special requirements regarding building insulation and energy efficiency of buildings on tendering company? That was the question to former tendering company. See below for results.



Graph 78. The degree of importance of planned building's insulation and energy efficient property on final tender evaluation

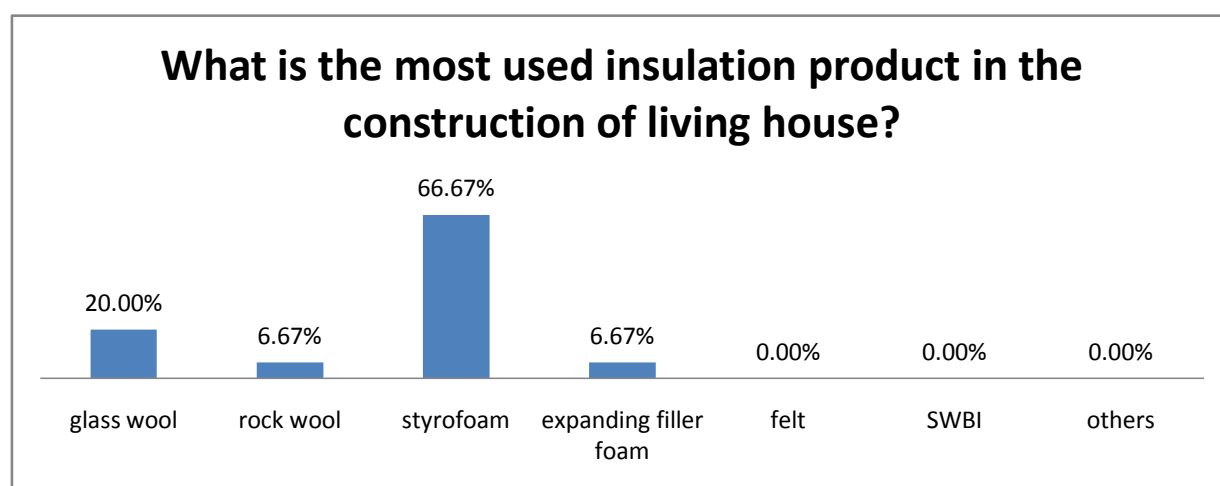
Though 33% of former tendering company acknowledged that building insulation and energy efficiency issues are important criteria in the tender requirement, it doesn't apparently have enough power to influence on the final evaluation of the tender. Therefore, raising SWBI awareness as import substitute, value added domestic product should be done at government level.

91% of respondents said there is standard and norms for insulation to be used in public service buildings. Only 9% rejected the existence of such standard. All buildings constructed by the respondents were insulated with below mentioned products (products prioritized by construction companies):

Priority indicator	Glass wool	Rock wool	Styrofoam	Expanding filler foam	Felt	SWBI	Others
Most used	20.00%	6.67%	66.67%	6.67%	0.00%	0.00%	0.00%
Second most used	36.36%	45.45%	9.09%	4.55%	4.55%	0.00%	0.00%

Table 30. Regularity of insulation products application in the buildings, by product types

The study results of insulation products use are shown on graph 79 (in percentage).



Graph 79. The frequency of insulation products use in the living houses, by product types

Most commonly used insulation product is Styrofoam (67%), followed by glass wool and rock wool as second and third most commonly used insulation products, because of their low cost, as well as their ideality for roof loft insulation.

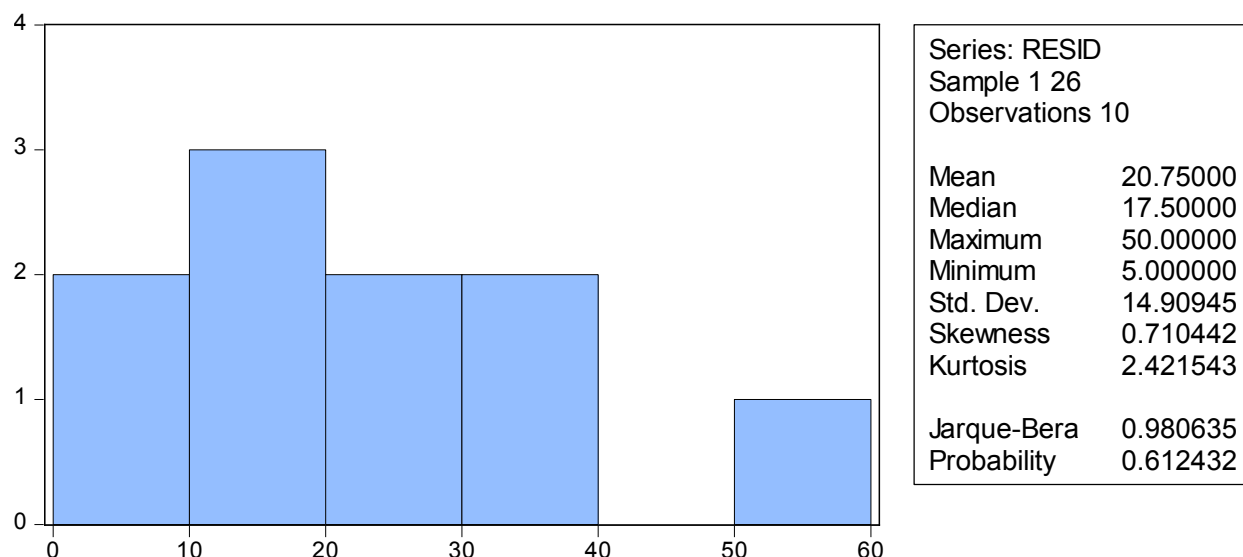
The reasons why home owners invest in house insulation shown below (from the construction company's point of view)

Priority of reasons	To reduce the heating costs	By the requirement of standards and norms	To improve living comfort	By the recommendation of construction designer	Eco-friendly, to reduce smoke	Other -
Most important	38.46%	15.38%	30.77%	15.38%	0.00%	0.00%
Second important	22.73%	22.73%	36.36%	9.09%	9.09%	0.00%

Table 31. The reasons of home owners investing into insulation, prioritized by constructors

The most prioritized reasons are to reduce energy consumption within house and to make life more comfortable.

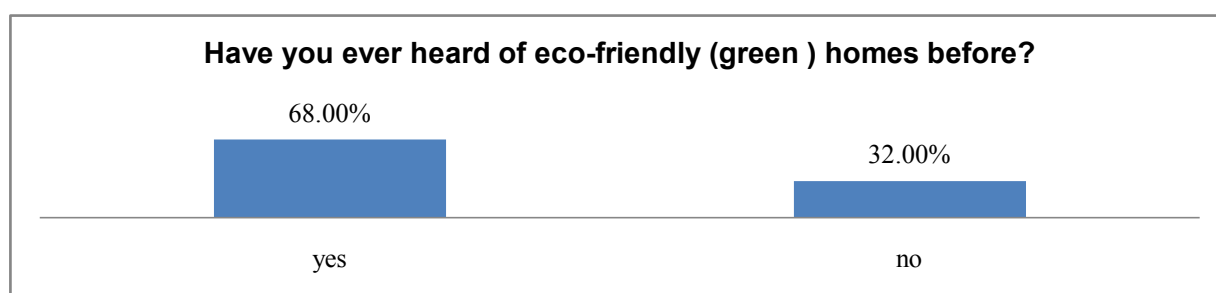
The incidents with clients who didn't want to get the house insulated were also investigated. 13% of respondent companies have seen clients who refused to get the house insulated because of high cost of insulation, while remaining 87% denied the encounter with such clients. The cost difference between insulated and non-insulated homes is calculated based on the data provided by respondents.



Graph 80. The price difference between insulated and non-insulated buildings

Only 10 respondents provided valid data. The mean difference between prices of insulated and non-insulated homes is estimated to be 20%, with minimum and maximum amounts being 5% and 50%.

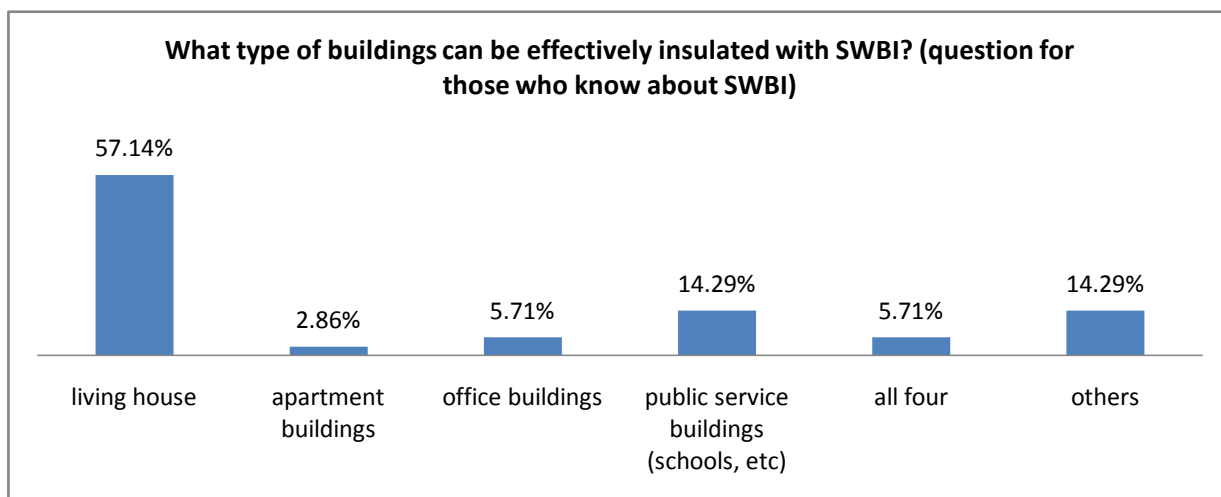
Significant 68% of total respondents admitted they heard of eco-friendly or green homes, and named Canadian house and straw bale house as an example. 32% were not aware of eco-friendly house.



Graph 81. Green homes awareness rate among construction companies

68% of total respondents answered "yes" to question if they have ever heard of SWBI, but none of them insulated a house with SWBI during last two years.

What type of buildings can be effectively insulated with SWBI? That was the open question for all respondents.



Graph 82. The appropriateness of building types to be insulated with SWBI

The target consumers would be the ones who live or want to live in detached houses and small living houses; those named by the construction companies as most suitable constructions that can be effectively insulated with SWBI.

Following are the recommendations and suggestions made by construction companies with regard to the introduction of SWBI at local markets:

- Product should be hygiene, free from allergy inducing agents, eco-friendly and conform to standards and norms for insulation products
- To demonstrate comparative advantages of SWBI over other products
- To demonstrate versatile application of SWBI in home insulation in a way that it impresses households living in basic detached houses
- To disseminate into policy documents
- To raise construction companies' awareness of SWBI
- To display economic benefit, comparative advantages and outstanding performances of products to consumers
- To develop viable marketing strategy with the assistance of professional agencies
- To display as national brand
- To highlight health friendly aspects of product
- To make eye catching TV commercial, to prepare smart promotional materials, to pick good retailing spots, to design good labeling and packaging solutions
- To display advanced performances of products, such as reducing heat loss, acoustic absorption coefficients, etc. To ensure fire safety measures are taken.
- Health friendly, eco product with no immediate competitor
- To set effective cooperation with mass media and construction companies in order to increase sales volume; to demonstrate various SWBI applications through display house and concentrate on making product more appealing to wealthy segment of the consumers who want to build private house
- To distribute product leaflet, promotional materials to construction design developers, to organize trainings and workshops jointly with construction designers, to make the product available in different forms and shapes that can be used in Canadian houses
- To conduct economic analysis of product including energy efficiency analysis
- To cooperate with small and medium construction companies that build private houses, to make sure the product price remains competitive

- To ensure good product start at the market; It is a good idea to start with small construction companies, individuals and teams of workers. Once you could demonstrate the excellent performance of your insulation product, the sales would go on its own, but it takes time, of course.
- More practical form and shape would be 60x60cm stiff plate, rather than roll of fluffy material. Insulation in the form of stiff plate is ideal to insulate roof lofts.
- To raise SWBI awareness of individuals who are one of your potential clients
- Ensure your product is reasonably priced. Try to get government support, i.e. to raise import tax for insulation products
- To promote as energy efficient, green product
- To present technical parameters of thermal conductivity of product

Followings are the bottlenecks in effective marketing of SWBI, from the respondents' point of view.

- Consumers' unawareness of SWBI
- Logistics of raw material procurement is unclear, vulnerability to fire hazards, product may attract insects
- Yet, no standard is available for SWBI
- Public unawareness of SWBI
- Energy coefficients, protection status against environmental risks and price remain unclear
- Totally new product, needs more testing and experiment
- May get infested with insects and rodents
- May lack structural stiffness
- Issues like energy loss coefficients, sales price and simplicity to handle remain uncertain
- Can't be used instead of Styrofoam
- May get infested with insects, less resistance to fire
- Not easy to use/handle
- Price and quality still unclear
- To give consumers a proper knowledge on fire safety issues of the product
- Product lacks stiffness
- May suffer from serious deformation under extended contact with water, insect repellents diffused with product should be effective and last long
- Product may start rotting under extended contact with water
- It requires extra efforts and cost for pest and rodents management including avian control, and fire safety measures
- Inconvenient to use as building insulation
- Totally new product to consumers

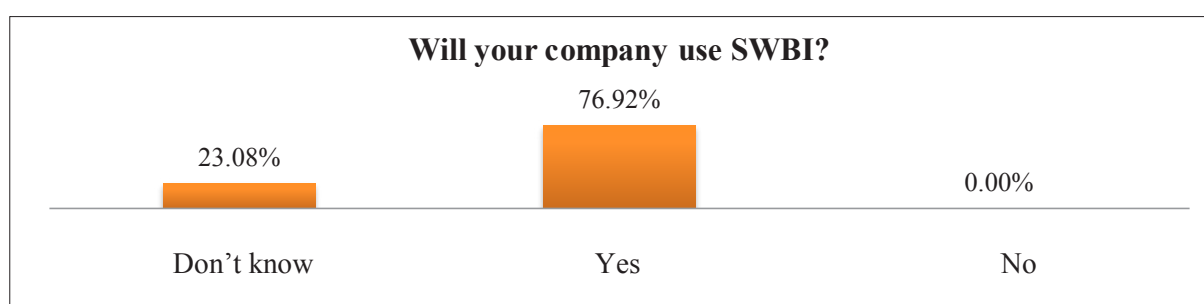
Following aspects should be taken into account when advertising SWBI (prioritized by respondent construction companies).

Priority of aspects	Excellent insulation product	Product from renewable agricultural resource	Excellent quality for competitive price	National brand	Innovative products with greater health benefits	Other -
Most important	36.84%	5.26%	21.05%	18.42%	18.42%	0.00%
Second important	9.09%	21.21%	15.15%	39.39%	15.15%	0.00%

Table 32. The list of flagship phrases for SWBI promotion, prioritized by construction companies

It is highly recommended to highlight the excellence of product's insulation performance and competitive pricing as key points in the advertisement of product.

Majority of respondent construction companies expressed their willingness to use SWBI.

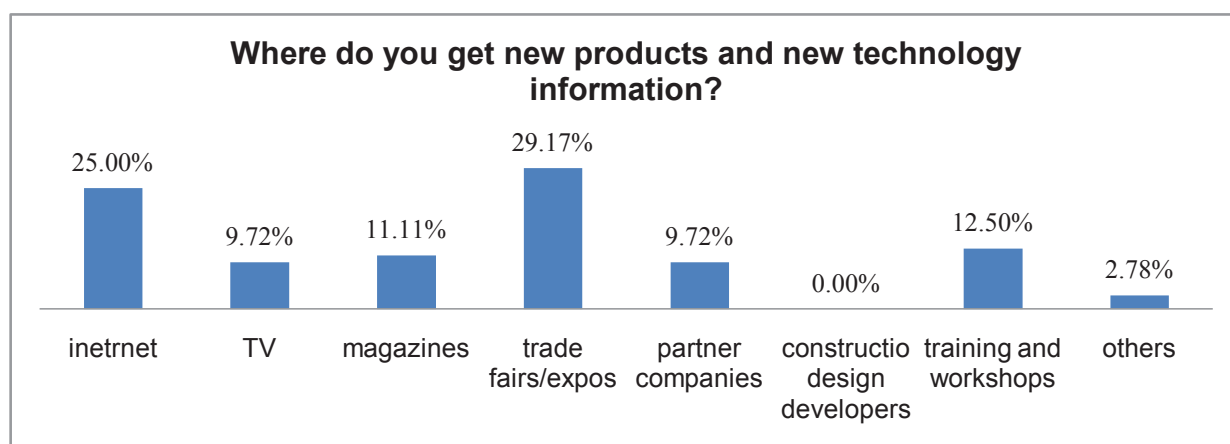


Graph 83. Willingness to use SWBI among construction companies

Despite the big number of companies interested in SWBI use, the product needs to be adjusted to comply with quality standards. SWBI technology unawareness among consumers and flexible roll form of product were the main factors of rejection by some 23.08% of respondents. Following are assumptions of 76.92% of respondents who voted for the use of SWBI.

- Product should fit to cost and application requirements
- Domestic production needs to be supported
- Must meet national energy efficiency standards
- Mongolians have long used fleece as insulation
- Will use if it was included in the house plan/design
- It should be included in house plan and priced lower than rock wool
- Only client decides what type of insulation products to choose
- Product's quality should be high, and it needs to be in ideal forms and shapes for various applications
- If product is reasonably priced, consumers would buy it even there is no standards
- Health and eco-friendly insulation product
- If quality is tested to comply with quality standards, consumers will use it
- Clients who want to build private houses choose construction materials on their own
- Excellent insulation product

Companies that carry out construction and assembly works, get new product information from following sources, as identified by the survey.



Graph 84. Sources of new technology information for construction companies

Product's introduction and promotion through websites, at the trade fairs/expos, trainings and workshops is expected to be more impactful as these channels are most actively used by companies to get new product's and new technology information.

Following are the selection factors of insulation products for construction companies.

Priority of factors	Degree of use	Price	Thermal conductivity	Easy-to-use, simplicity	Health friendliness	Environmental friendliness	Product's resistance to natural phenomenon (sunlight, rain, pests and rodents)	Durability and quality	Fire resistance	Product's brand
Priority# 1 (top)	7.69%	26.92%	34.62%	15.38%	15.38%	0.00%	0.00%	0.00%	0.00%	0.00%
#2	3.85%	19.23%	30.77%	15.38%	3.85%	0.00%	0.00%	7.69%	19.23%	0.00%
#3	4.17%	16.67%	12.50%	12.50%	16.67%	12.50%	0.00%	16.67%	8.33%	0.00%
#4	0.00%	0.00%	5.88%	35.29%	11.76%	5.88%	23.53%	11.76%	5.88%	0.00%
#5	0.00%	0.00%	0.00%	7.14%	21.43%	21.43%	28.57%	7.14%	7.14%	7.14%
#6	0.00%	20.00%	10.00%	10.00%	10.00%	20.00%	10.00%	20.00%	0.00%	0.00%
#7	0.00%	10.00%	10.00%	10.00%	10.00%	20.00%	10.00%	10.00%	20.00%	0.00%
#8	20.00%	20.00%	20.00%	0.00%	10.00%	0.00%	10.00%	10.00%	10.00%	0.00%
#9	60.00%	0.00%	0.00%	0.00%	0.00%	20.00%	0.00%	0.00%	0.00%	20.00%
#10 (least)	11.11%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	88.89%

Table 33. The list of factors that influence on selection of insulation products among construction companies

Thermal conductivity, price, simplicity to use and health friendly aspects of the insulation products are the top priorities for construction companies, as shown in Table 32. If the thermal conductivity of insulation product is the top priority for 35% of total respondent companies, the price of a product is the top priority for some of 27%. Therefore, using price and low thermal conductivity of SWBI as leverage at the market would surely pay off. Equal consideration of health and environmental friendliness of the product would also encourage marketability of SWBI.

CONCLUSION

The entire research effort was aimed at identifying SWBI awareness among public and gathering relevant data to assess marketability of SWBI through pre-developed questionnaire to analyze competitiveness of traditional insulation materials at local markets, identify potential buyers and to evaluate insulation market capacity. Total of 699 randomly picked individuals and business entities completed market research survey in Ulaanbaatar, Darkhan, Erdenet cities.

The percentage of basic detached house and ger dwelling households with monthly incomes of 500,000-1,000,000 MNT makes up 79% of total individual respondents, which shows that majority of focus group households are low income families.

Construction insulation product market is dominated by Styrofoam and glass wool (accounting for almost 80-90% of total market share). Rock wool, a closest match to SWBI, holds modest 5-6% of insulation market. Price shouldn't be as the same as or higher than rock wool's, considers sizeable portion of respondents. Lower price and simplicity to use/handle would buy SWBI an advantage. The consumers' expectations of new product are largely positive. The welcoming words such as domestic product, low cost product with higher insulation performance, product of renewable agricultural resource and abundant supply of domestic raw materials were articulated many times.

The most recognized and famous insulation products are Styrofoam and glass wool, and individual consumers' preference is determined by the price, health friendliness, safety and quality features of the product, while construction companies are more concerned about insulation product's price, thermal conductivity, health friendliness and simplicity to use. 96% of individual consumers go to big construction material markets such as 100 ail, Gurvaljin, Tekh, Tsaiz and Khangai for insulation products, however most transactions are done at 100 ail, Gurvaljin and Tsaiz markets. 67% of house dwellers can invest 500,000-2,000,000 MNT in adding insulation to their homes and reducing energy consumption within house by half.

63% of apartment dwellers are living in old district built before 1990. Prefabricated constructions are home to 46% of apartment dwellers. The heat loss of old impairment buildings is enormous; occupants' complaints about poor thermal comforts in the homes are related to lack of proper insulation around door and window frames and sills. Therefore, the energy consumption in these buildings should be enormous as well. Many apartment dwellers admitted their use of additional heating system inside homes during cold season. A crushing 96% of apartment dwellers who are unhappy with thermal comfort inside of their homes expressed their intention to add insulation in 1-2 years time.

The specialists from the Administration of Housing and public utilities expressed their concerns about thermal uncomfortability in residential apartments mainly due to improper or lack of insulation around door and window frames/sills. The prefabricated constructions in these days are notorious heat losers, and the tenants are reluctant to add insulation to areas through which the heat is being lost, say AHPU specialists.

The fact that SWBI is a domestic products significantly attracts consumers, backed up with other expectations such as low cost product with excellent thermal insulation performance, reveals study. 78% of individuals admitted they never heard of SWBI. However, those who said who heard of SWBI often confused it with regular felt products, which leads to conclusion that the percentage of individuals who know about SWBI can be even less. TV and rumors by friends and acquaintances were major source of SWBI information for individuals.

The limiting factors for efficient use of SWBI can be product's foul odor, weak fire resistance and complexity of use, as well as its possible attraction of insects and rodents and risk of rotting in moist condition, by 39% of individuals who is reluctant to use SWBI.

The SWBI awareness virtually lacks among public. 86% of individuals have never heard of environmentally friendly homes. Meager 14% said they knew green homes and could name only Canadian house as an example. Environmentally friendly homes are not really important for 94% of individuals, the survey study shows.

Consumers' expectation of SWBI being very effective insulation product that can reduce energy consumption in the house by 50% is apparently associated with traditional use and acceptance of felts as best insulation of gers. The expectation is shared by almost 75% of individuals. The expectation should be met by producers if they want to improve marketability of product.

Companies that carry out construction and assembly works use insulation products that are specified in the building plans, and this tendency implies the producer to concentrate more on efficient cooperation with construction design developers. Internet based websites, expos/ trade fairs, training and workshops are the main source of information for 67% of construction design developers and construction companies. Therefore promotion of product requires quite a radical strategy for companies, rather different than the one for masses/ individual consumers.

The building insulation takes up 17.5% of total construction cost of building. The total construction sector turnover (construction of residential and non-residential buildings, capital repair of existing constructions) is estimated at 175 billion MNT. This shows the potential market space for SWBI. 26% of national construction projects are implemented in Ulaanbaatar, with 14% in Erdenet and 9% in Darkhan respectively. These percentages can fairly represent the estimated use of insulation products on national scale. Current use of SWBI in the construction market is nil. It needs time and money to bring the product into the market. However, cost efficient ways of product introduction shall be sought. Apart from some retailers who accept to sell product after it is recognized by the users and becomes marketable item, there are bunch of other retailers who are ready to start selling products right away if distributor's price is agreed with producer. The survey also revealed that the target group for small retailers is individual consumers, while larger wholesalers and construction material selling companies focus on big consumers like construction companies.