an advisor system or an assessor system, so if we could back this up and improve this system we could be closer to the British Green Deal. And another aspect is that, I wondered if there is any system where we could confirm people's efforts in energy saving. We have HEMS and we have smart meter systems, so we could think of that as a baseline. And the Ministry of Environment has also been working on measuring households' efforts to reduce emissions and we have been compiling statistics as well and that could be used.

We believe there are some challenges going forward. One is, how do we link up our Household Energy Assessment with other supporting schemes? Another issue here is how to involve financial organization. For the financial organizations there is a problem of accrediting individual households. So, we have to find partner stakeholders to deal with this problem. Thank you very much.

Takase: Thank you very much. Next, I would like to give the floor to the presenter of the Ministry of Land, Infrastructure, Transport, and Tourism, Mr. Takeshi Miyamori. He is a deputy director of Housing Production Division, Housing Bureau.

Trends in Energy Conservation Measures for Housing and Buildings in Japan

Presentation by Mr. Takeshi Miyamori (Deputy Director, Housing Production Division, Housing Bureau, Ministry of Land, Infrastructure, Transport and Tourism)

Miyamori: I would like to discuss energy conservation at housing and buildings, and low carbon measures in the housing and building sector.

Trends in Energy Conservation Measures for Housing and Buildings in Japan

February 24, 2014

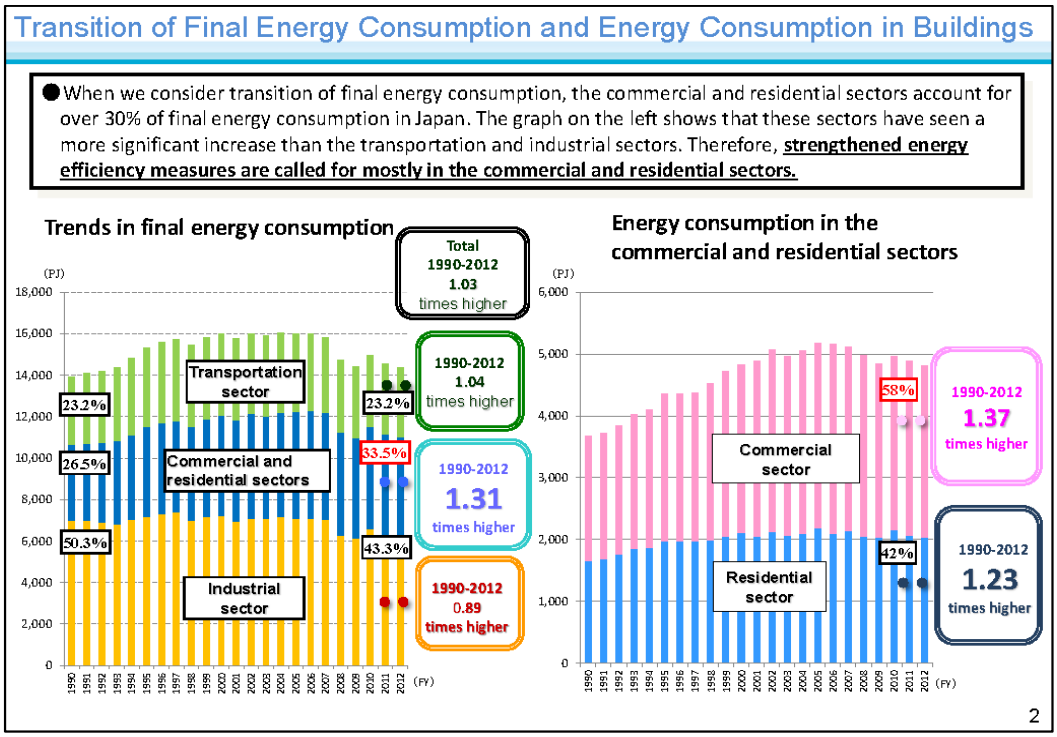
Ⅰ Current Status and Issues
Ⅱ Responding to Issues

Takeshi Miyamori
Housing Production Division, Housing Bureau

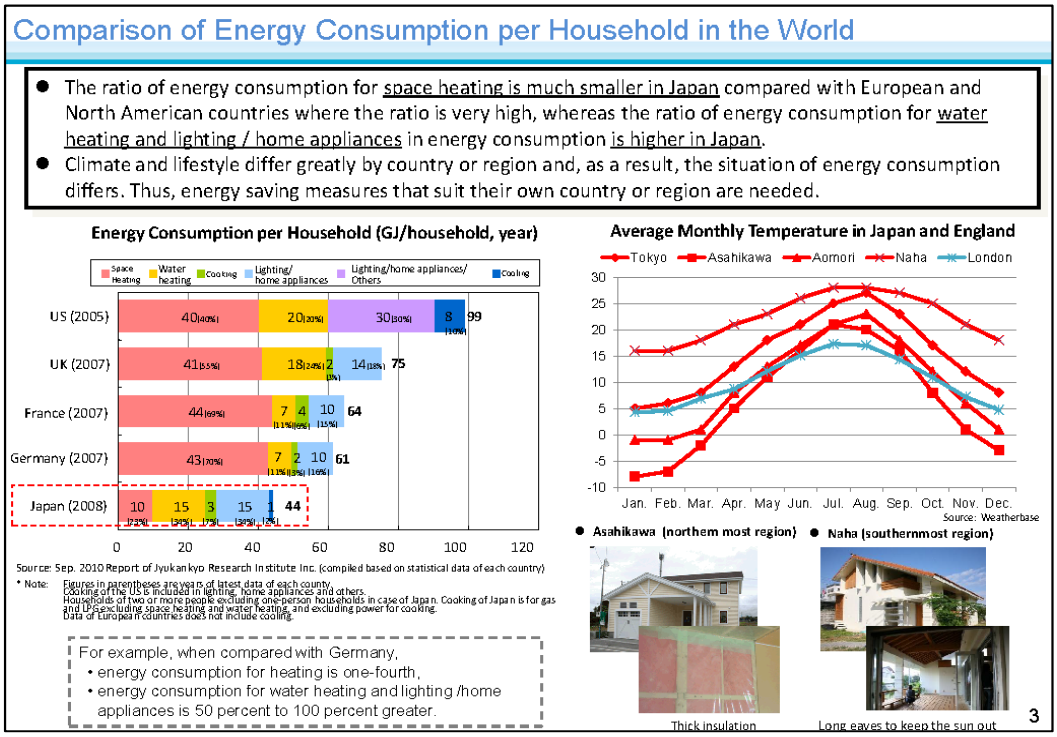
国土交通省
Ministry of Land, Infrastructure, Transport and Tourism

Ⅰ Current Status and Issues

国土交通省
Ministry of Land, Infrastructure, Transport and Tourism

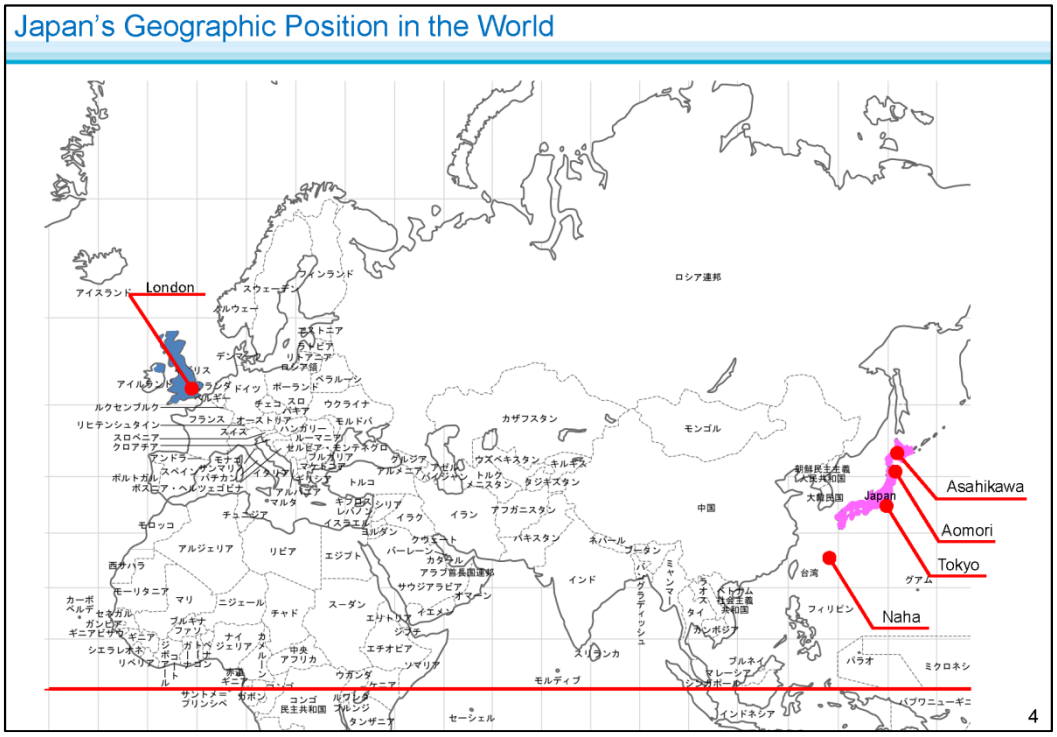


Please take a look at this slide. Energy consumption in buildings has increased dramatically. Per household consumption has decreased but the energy consumption in residential & commercial sector has increased over the years due to the increases in the number of households. The British Green Deal policy has been referred to as a lesson for us to create our own system but there are some differences between the UK and Japan and I would also like to discuss those differences.



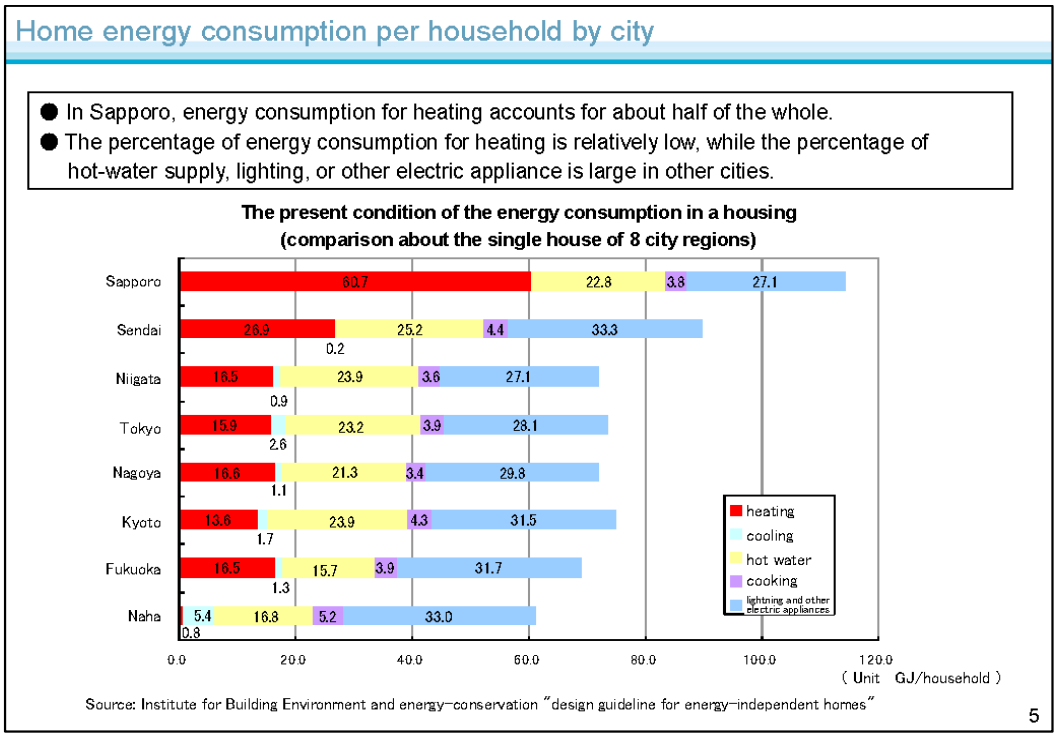
Now, in terms of energy consumption per household, UK households tend to spend more energy in heating of the house. In Japan, there are some regional variations from Hokkaido in the north to Kyushu in the south, but heating costs are not necessarily a large proportion of energy consumption in Japanese households. Due to the Japanese lifestyle of hot baths, we tend to spend more energy on the hot water supply. It seems that Japanese people houses are not heated enough, but this small amount is due to the custom of intermittent heating, and also heating only the room they stay. It is not normal to warm the house as a whole all day long, expect for the cold area of Hokkaido etc. This is one of the features of Japanese energy use.

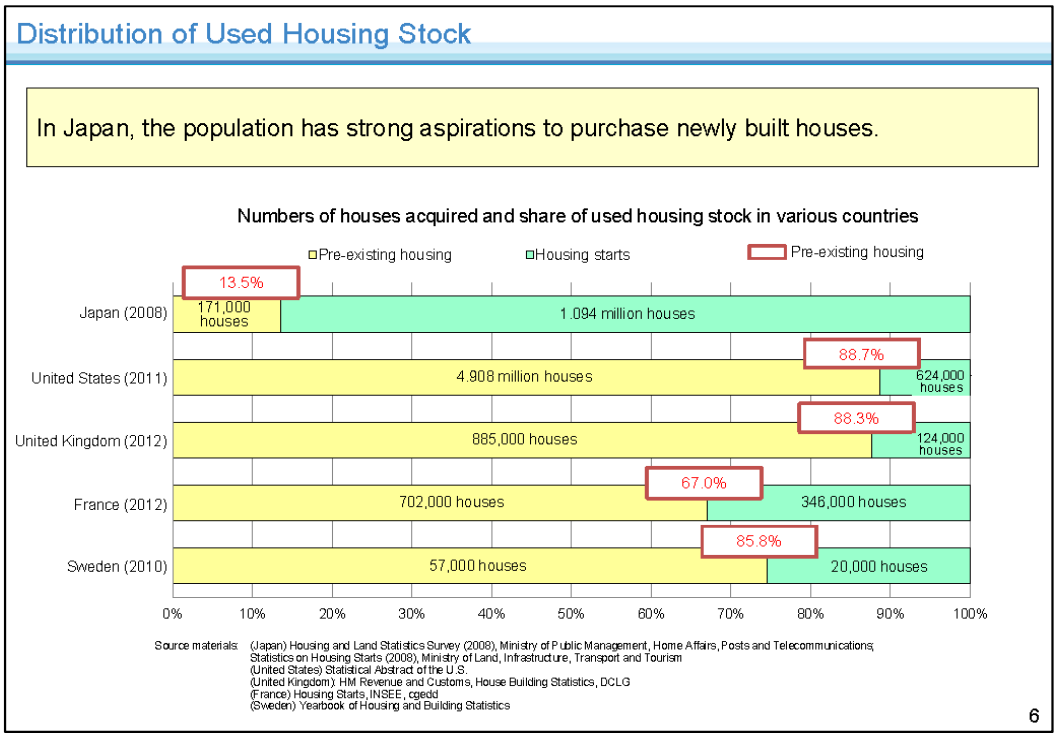
Actually, small amount of heating energy is one of the barriers to induce upgrading insulation. If the heating cost is large, then it will be easier for the household to be paid back their cost of retrofitting. The heating cost is not large, therefore it is not easy to promote better insulation. In Japan, we stipulate different energy efficiency standards for each 8 area. In Hokkaido in the north, the thicker insulation or higher performance equipment can help reduce the energy consumption, but in Okinawa, better sun shading will help reduce cooling costs in the summer so there are some regional differences as well.



This is the geographical location of Japan showing the regional or climatic difference between Hokkaido, in areas such as Asahikawa, and Naha in Okinawa.

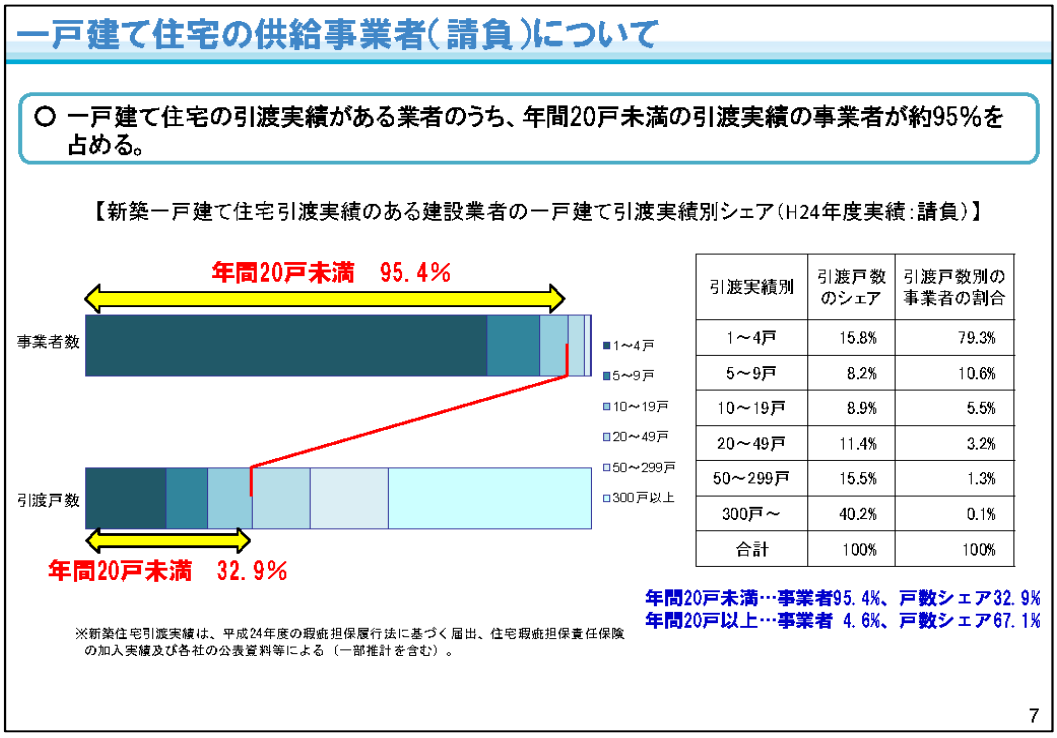
And this is the actual home energy consumption per household by city. You can see there are vast variations between regions and we have to come up with different energy conservation standards. In Okinawa sun shielding plays a major part in promoting higher energy conservation.





Now with regard to market structure, one of the unique factors of the Japanese housing market is that most of the distribution is dominated by newly built homes, and previously owned houses account for only 13.5%. As the British speaker mentioned, there are a number of houses that have existed several hundred of years. We are also promoting a longer lifetime of Japanese houses and secondhand market. One of the advantages of the Japanese market situation is that we can easily promote higher efficiency if we focus our attention on newly built homes.

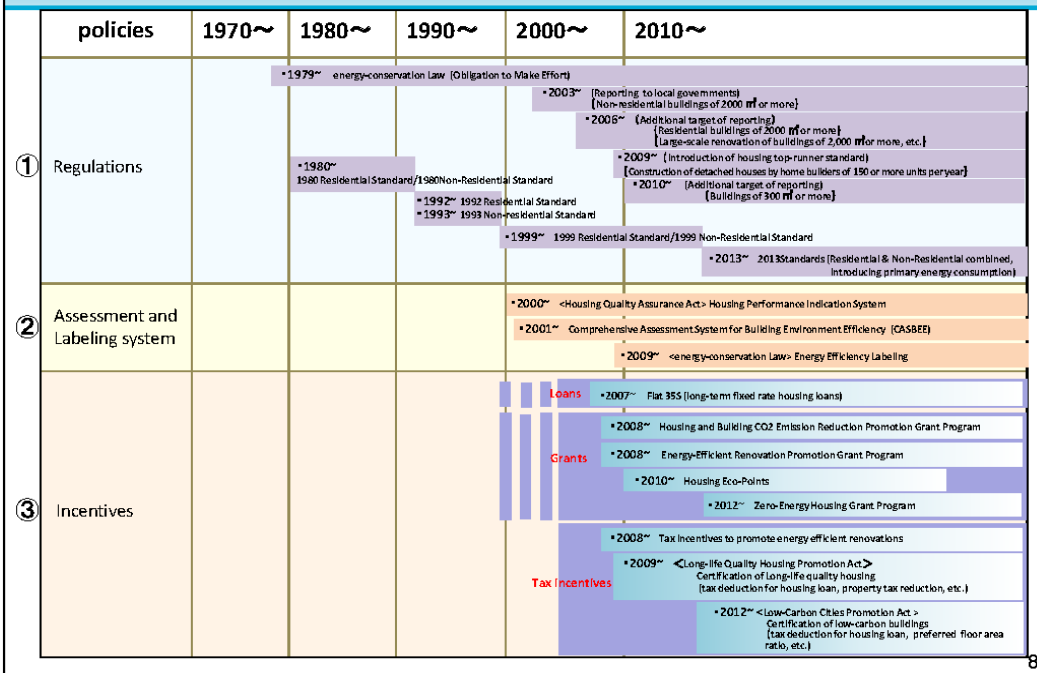
But existing houses are not in the market, and we also need to tackle efficiency improvement of the housing stock.



Another unique factor for the Japanese market is that many of the home builders in this country are SMEs and those SMEs construct less than 20 detached houses per year. How do we promote higher energy conservation for smaller-scale home builders that build less than 20 homes a year? Insulation is often at times very difficult when they are using a conventional building method so that also means that we need to provide some training for home builders as well.

I will talk about what MLIT has done up to now. Under the scheme of the Energy Conservation Law we have expanded the coverage under which entities are obliged to meet the standards, make reports and notices to the government. We still have these standards as non-obligatory standards so this is an area that we have to work on until the year 2020. Also house energy performance needs to be labelled as well. We have a law to promote labeling of houses, and CASBEE system for the non-residential buildings. As for incentives, loans, subsidies or tax systems can help promote energy conservation.

Building Energy Efficiency Policies in Japan



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Regulation based on the Energy Conservation Law

【Obligation to submit a plan of energy efficiency measures】

- Report to the local government on energy efficiency measures was required for non-residential buildings (floor area ≥ 2,000 m^2) in 2003, for residential and non-residential buildings (≥ 2,000 m^2) and large-scale renovation of residential and non-residential building (≥ 2,000 m^2) in 2006, for construction of residential and non-residential buildings (≥ 300 m^2) in 2010.
- Administrative actions such as recommendation may be taken when the building energy efficiency measures are deemed materially insufficient according to the Energy Efficiency Standard.

・Buildings for which reporting of building energy efficiency measures are mandatory

	Type 1 Specified Buildings	Type 2 Specified Buildings
Target buildings (floor area)	2,000 m^2 or more	300 m^2 or more, but less than 2,000 m^2
Target work	New construction, addition and rebuilding beyond a fixed scale	New construction, addition and rebuilding beyond a fixed scale
	Repair or a change of roof, wall, or floor beyond a fixed scale	-
	Installation of air conditioners or repair thereof beyond a fixed scale	-
Actions to be taken by the local government	Instruction, publication, order or penalties	Recommendation

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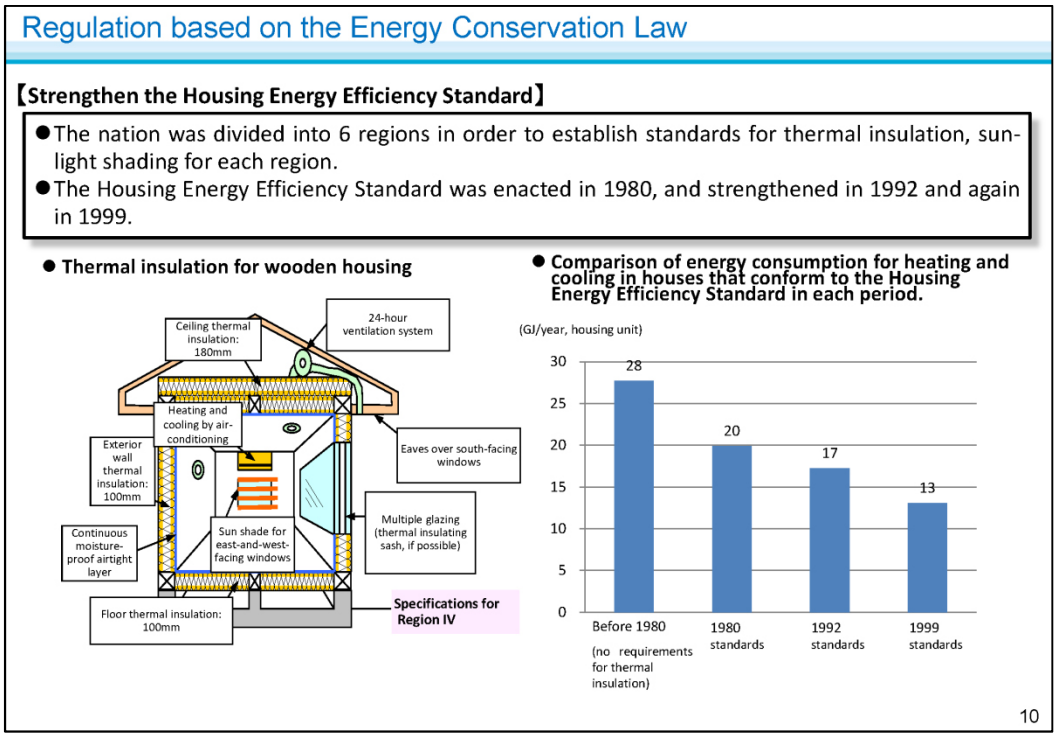
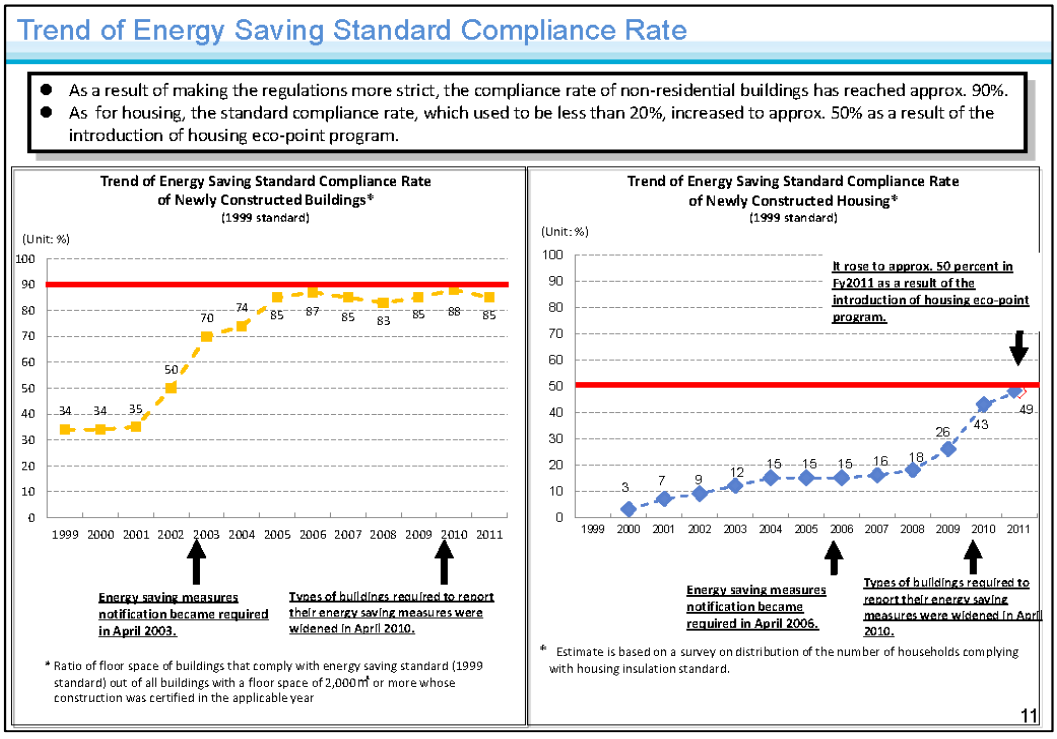
Due to the time restriction, I will skip these slides.

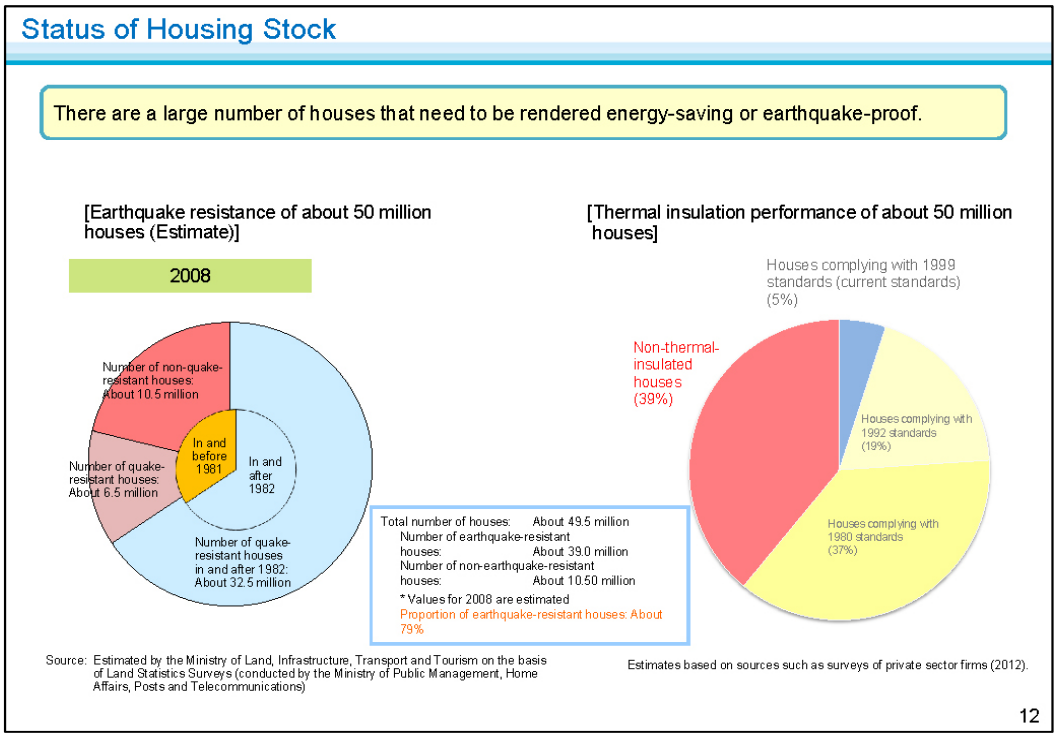


Now regulations based on the Energy Conservation Law. We have only set the standard for the level of insulation for homes. We have made the regulations for the insulation stricter over the years.



For newly built homes, the rate of compliance to those standards for non-residential buildings is very high, hovering around 90% or higher. However as for residential buildings, the rate of compliance is 50% or less and the challenge is to raise this proportion and the question is how to incentivize the new home owners to increase

their home energy efficiency. House "ecology points[3]" have proven to be a very good impetus and that is one of the reasons why the rate of compliance has risen to 50% but we need to further increase this rate.



As for the status of housing stock, energy saving and earthquake proofing are two major stakes but one of the challenges is that it is not necessarily easy to promote those even though people are aware of the benefits.

[3] Japanese subsidy plan allowing refundable points when purchasing energy-efficient electric appliances, etc.

日本再興戦略（平成25年6月14日閣議決定）＜住宅・建築物の省エネ施策関連抜粋＞

テーマ2：クリーン・経済的なエネルギー需給の実現（本文）

（２）個別の社会像と実現に向けた取組

③エネルギーを賢く消費する社会

Ⅱ）解決の方向性と戦略分野（市場・産業）及び当面の主要施策

（略）また、近年エネルギー消費量が著しく増大（石油危機以降2.5倍）している家庭・業務部門を中心とした省エネの最大限の推進を図る。そのため、燃料電池の導入や住宅・ビルの省エネ基準の段階的適合義務化、既存住宅・ビルの省エネ改修の促進、トップランナー制度の適用拡充、ネット・ゼロ・エネルギー化等を図る。また、生活の質を向上させつつエネルギー消費量を削減するライフスタイルの普及を進める。

○住宅・建築物の省エネ基準の段階的適合義務化

- 規制の必要性や程度、バランス等を十分に勘案しながら、2020年までに新築住宅・建築物について段階的に省エネ基準への適合を義務化する。これに向けて、中小工務店・大工の施工技術向上や伝統的木造住宅の位置付け等に十分配慮しつつ、円滑な実施のための環境整備に取り組む。
- 具体的には、省エネルギー対策の一層の普及や住宅・建築物や建材・機器等の省エネルギー化に資する新技術・新サービス・工法の開発支援等を実施する。

2020年、2030年目標（中短期工程表）

・新築住宅・ビルの省エネ基準適合率100%（2020年目途）
・（住　宅）2020年までにゼロエネルギーハウスを標準的な新築住宅に
　　2030年の新築住宅が平均でゼロエネルギー住宅（ZEH）を実現
・（建築物）2030年の新築建築物が平均でゼロエネルギー建築物（ZEB）を実現

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Measures that have been taken in recent years are part of the “Japan Revitalization Strategy” that was formulated last year.　As for the newly built homes, by 2020 we are going to make this requirement mandatory and will be taking necessary measures for existing housing as well.　Further, a higher level of net zero buildings will be promoted as written, to achieve goal of zero energy requirement from newly built houses on average by the year 2020.　For the non-residential buildings, we have similar target that is very high level.

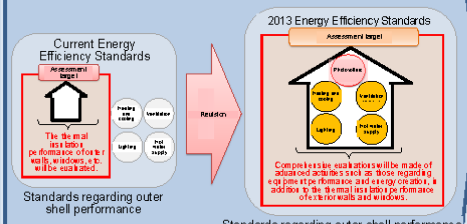
Promoting Energy Conservation by Buildings

Energy conservation of buildings will be promoted through means of "control," "evaluation and indication," "provision of incentives," etc., with the ultimate goal of realizing a low carbon society.

Achieving energy conservation of buildings

Revision of Energy Efficiency Standards

Residential: Standards will be enforced starting April 2013. (Interim measures will be taken for one year.)
Non-residential: Standards are scheduled to be put into force in October 2013. (Interim measures will be taken for one and a half years.)



Formulation of low carbon Building Certification Standards　(Standards will be enforced starting December 2012.)

Newly built houses for which certification is obtained will be subject to tax rebates etc.

(1) Control based on the Energy Conservation Law

◆Actions aimed at the dissemination of the 2013 Energy Efficiency Standards (such as workshops for medium- and small-sized construction and carpentry firms)

◆Studies and setup development in preparation for obligatory enforcement

- Study of method of evaluating traditional wooden housing etc.
- Securing and improvement of performance and quality of construction materials and equipment
- Development of evaluation and review setup

(2) Evaluation and indication of energy conservation performance

◆Measures such as reexamination of the Housing Performance Indication Standards

- By taking account of the revision of the Energy Efficiency Standards, measures regarding primary energy consumption amounts and other matters will be introduced into the standards.
- A study will be made of a system whereby energy conservation performance including that of existing stock is evaluated and indicated.

(3) Provision of incentives

◆Assistance for buildings excelling in energy conservation performance, such as low carbon houses and zero-energy houses

◆Promotion of energy conservation modification of existing stock (including modifying existing housing into outstanding housing over the long term)

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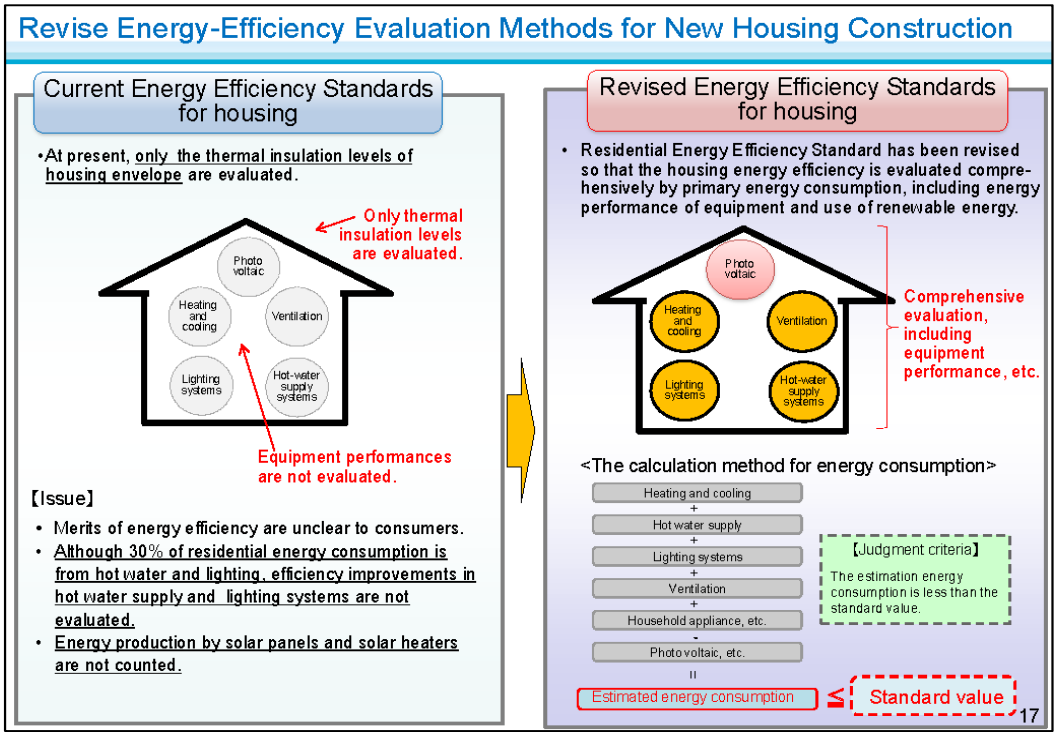
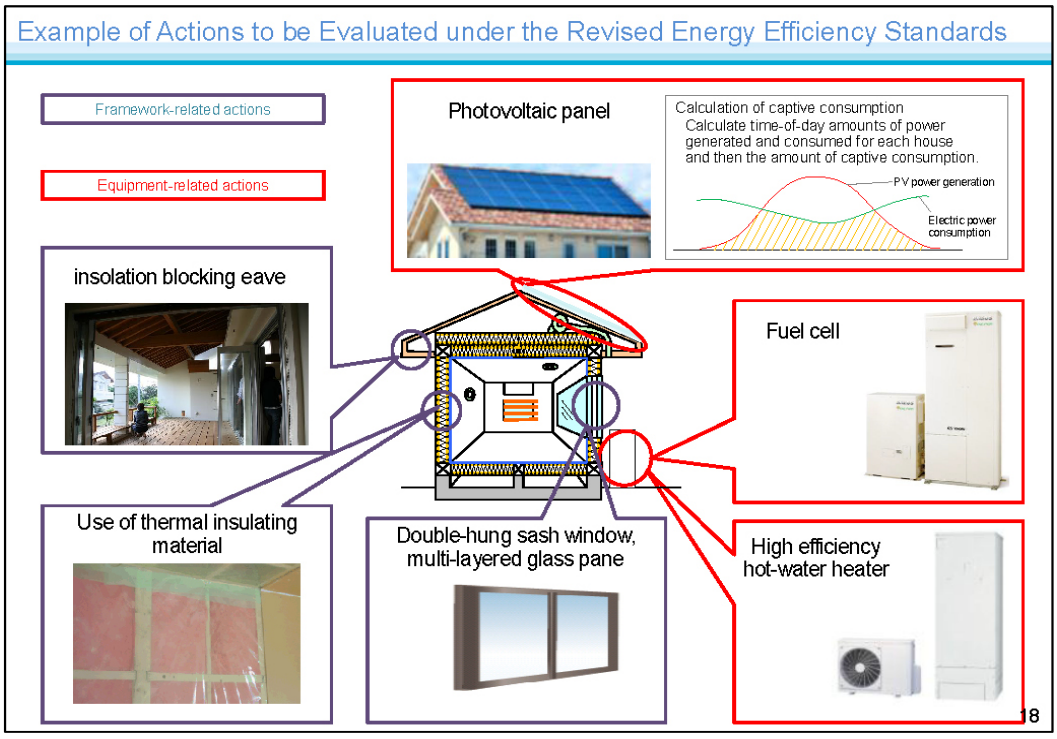
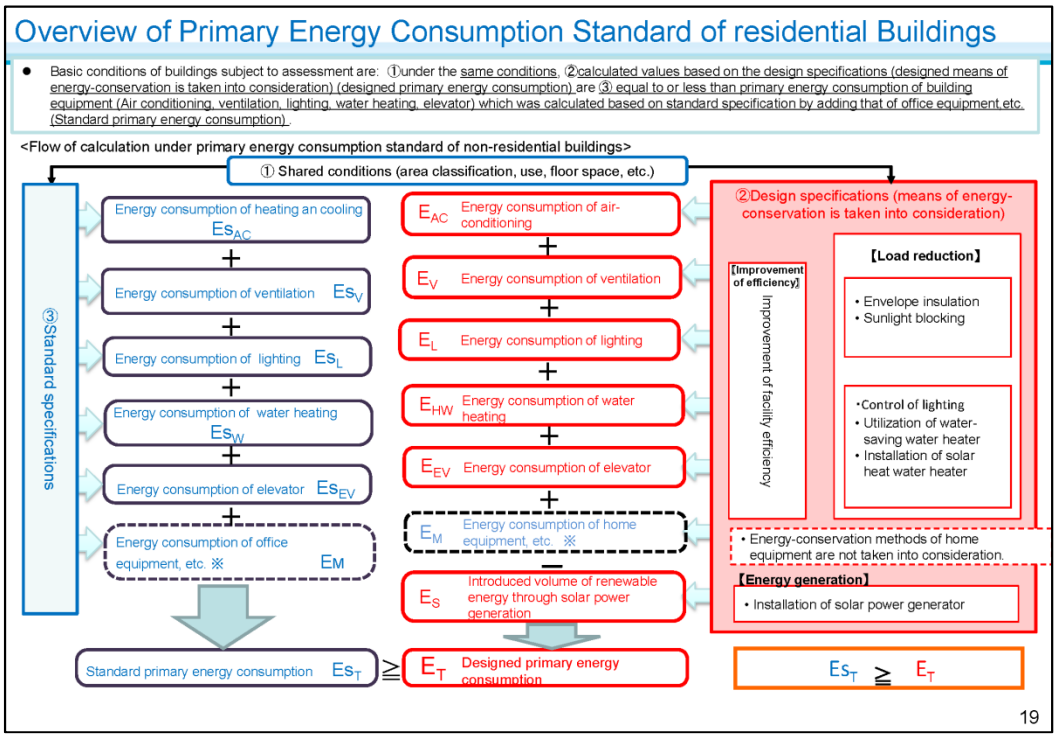
Over the last one to two years, regarding energy conservation standards, insulation was the only criteria that the regulation was looking after but last year the law was revised to expand the scope of the regulations to include whole facility of the houses, such as boilers and other factors. It is also discussed to include less CO_2 emission by putting solar PV as far as the electricity generated is used at home.

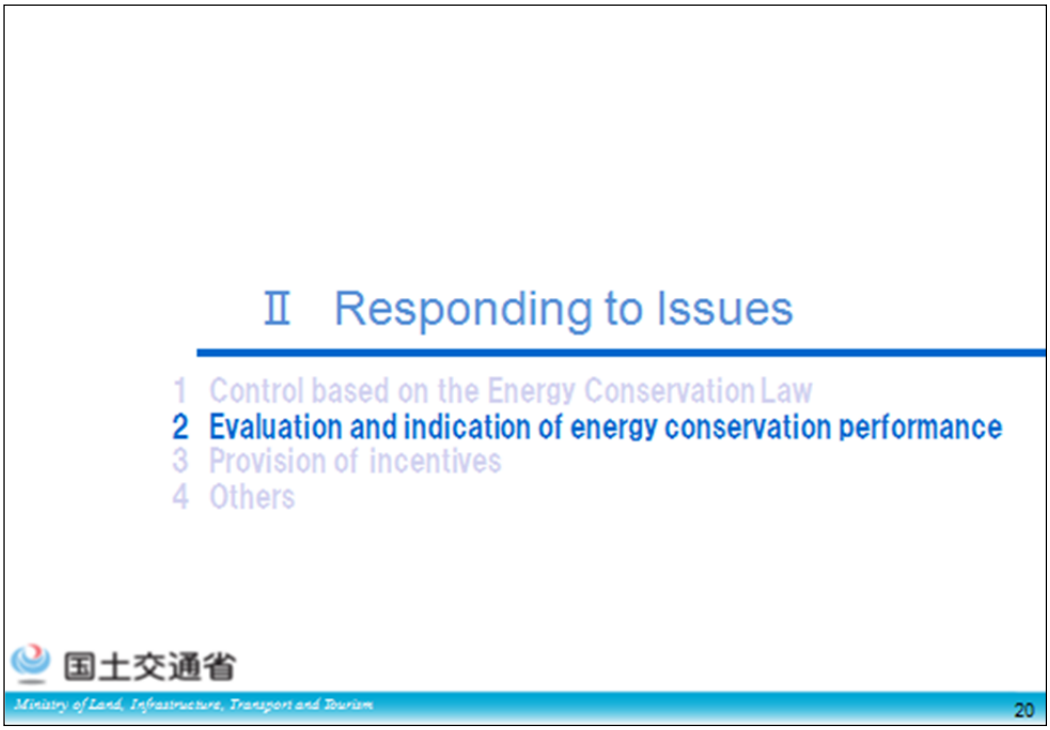


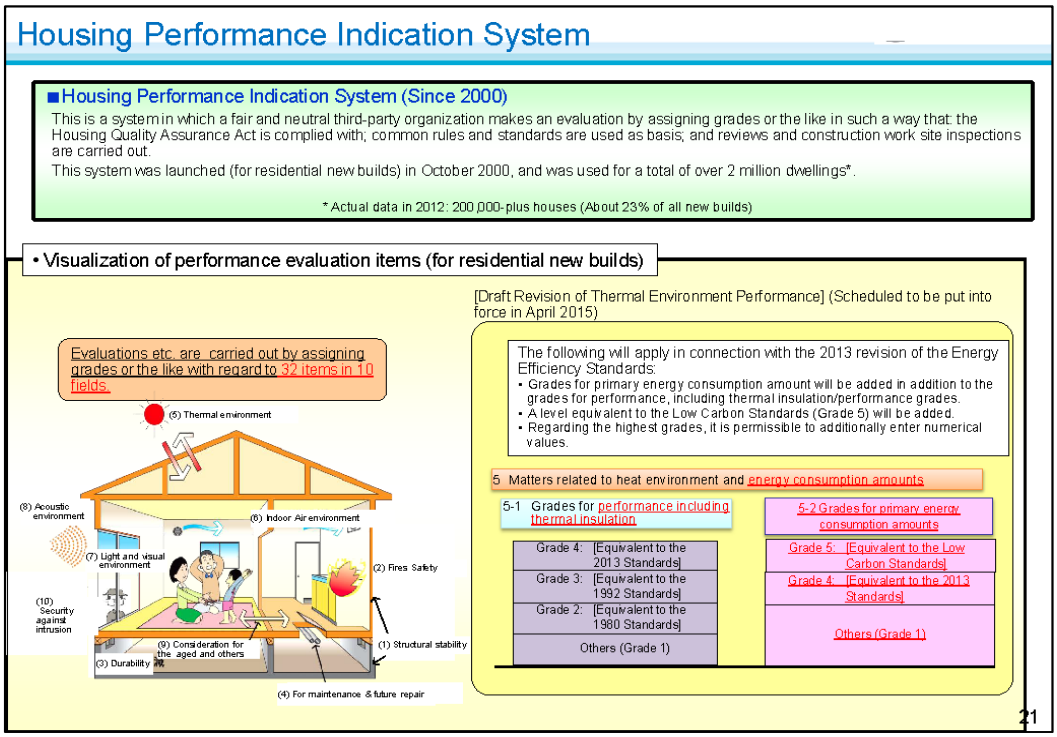
To more broadly review the energy performance and captive consumption will also be factored into evaluating the

energy performance of a house, in addition to the performances of equipment and other facilities installed within the building.









Under the law, performance needed to be indicated for the newly-built houses. 20% of newly-built houses have labels for matters such as the level of earthquake resistance or acoustic performance. The level of insulation was indicated by grades but we have new grades for primary energy consumption amounts. The highest level of grade 5 in primary energy consumption grades is 10% stricter than the energy efficiency standard by "ecology town law" two years ago. We expect that, by promoting labeling, efficient houses get higher evaluation, and it

would incentivize higher efficiency.

This is for non-residential buildings. BREEAM in the UK, or LEED in the US or CASBEE in Japan have labelled overall environmental performances, but this “BELS (Building Energy-efficiency Labelling System)” focuses specifically on energy efficiency performance which will be launched sometime in spring this year. For the existing building, if the building is big enough, you would choose overall environmental performances to label, such as CASBEE, but if the building is small, and labeling by CASBEE standard would be too much work, then BELS can be chosen, to show only energy efficiency in the building market.

住宅・建築物に関する主要な省エネ支援施策（H26年度予算案等）

	住 宅	建 築 物
融資	【(独)住宅金融支援機構のフラット35S】新築 ○耐震性や省エネルギー性等に優れた住宅を取得する場合、当初5年間の金利を0．3%引き下げ ○認定長期優良住宅等の特に優れた住宅を取得する場合は、当初10年間の金利を0．3%引き下げ	【日本政策金融公庫の低利融資】新築 改修 ○認定低炭素建築物を新築等する場合、当初2年間の特別利率（基準利率－0．65%等）による貸付け
税	【所得税／登録免許税／不動産取得税／固定資産税】改修 ○一定の省エネ改修を行った住宅について、所得税・固定資産税の特例措置 ○認定長期優良住宅について、所得税・登録免許税・不動産取得税・固定資産税の特例措置 ○認定低炭素建築物について、所得税・登録免許税の特例措置 【贈与税】新築 改修 ○省エネ性を満たす住宅を新築若しくは取得又は増改築する場合の贈与税について、一定金額まで非課税措置	【法人税／所得税】新築 改修 ○一定の省エネ設備の取得等をし、事業の用に供した場合は、即時償却（特別償却）又は税額控除の特例措置を適用
補助	【住宅・建築物省CO2先導事業】新築 改修 ○先導的な省CO2技術に係る建築構造等の整備費、効果の検証等に要する費用 等 【補助率】1／2 【ゼロ・エネルギー住宅推進事業】新築 ○中小工務店においてゼロ・エネルギー住宅とすることによる掛かり増し費用相当額 等 【補助率】1／2（補助限度額165万円／戸） 【長期優良住宅化リフォーム推進事業】改修 ○既存住宅の長寿命化に資するリフォームに要する費用 等 【補助率】1／3 （補助限度額100万円／戸 等）	【住宅・建築物省CO2先導事業】新築 改修 ○先導的な省CO2技術に係る建築構造等の整備費、効果の検証等に要する費用 等 【補助率】1／2 【建築物省エネ改修等推進事業】改修 ○既存建築物について躯体改修を伴い省エネ効果15%以上が見込まれる省エネ改修の費用 等 【補助率】1／3（補助限度額5000万円／件 等）

※1 長期優良住宅：長期にわたり良好な状態で使用できる耐久性、耐震性、維持保全容易性、可変性、省エネ性等を備えた良質な住宅として、認定を受けた住宅
※2 低炭素住宅・建築物：高い省エネ性能等を備えた住宅と・建築物として、認定を受けた住宅・建築物

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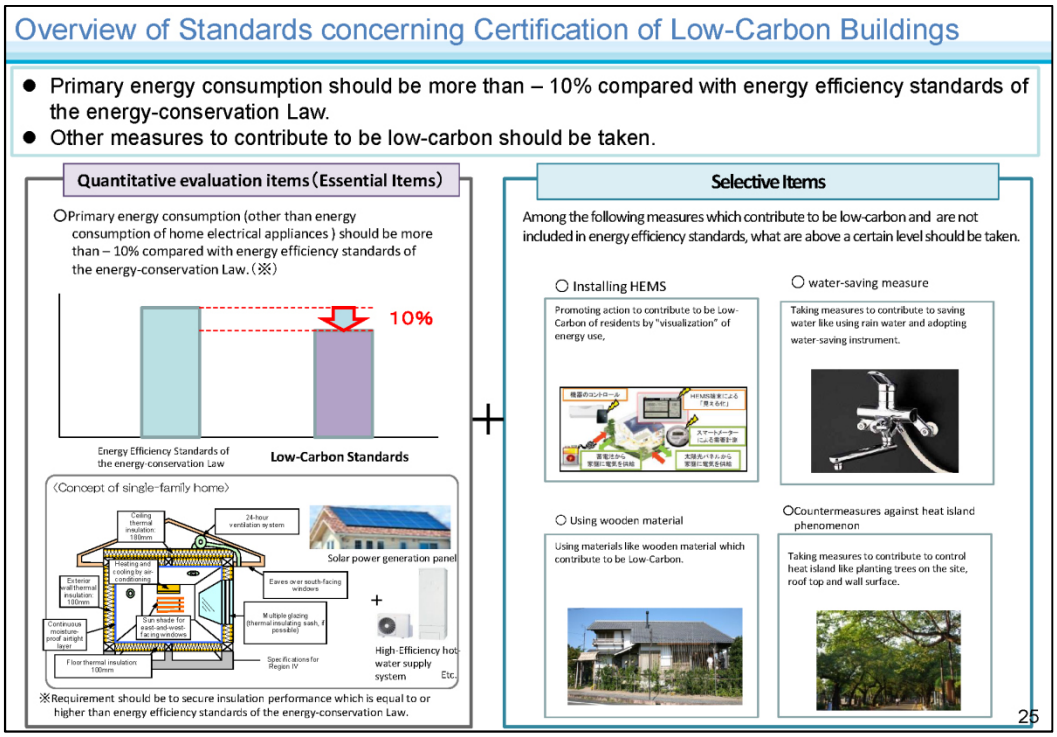
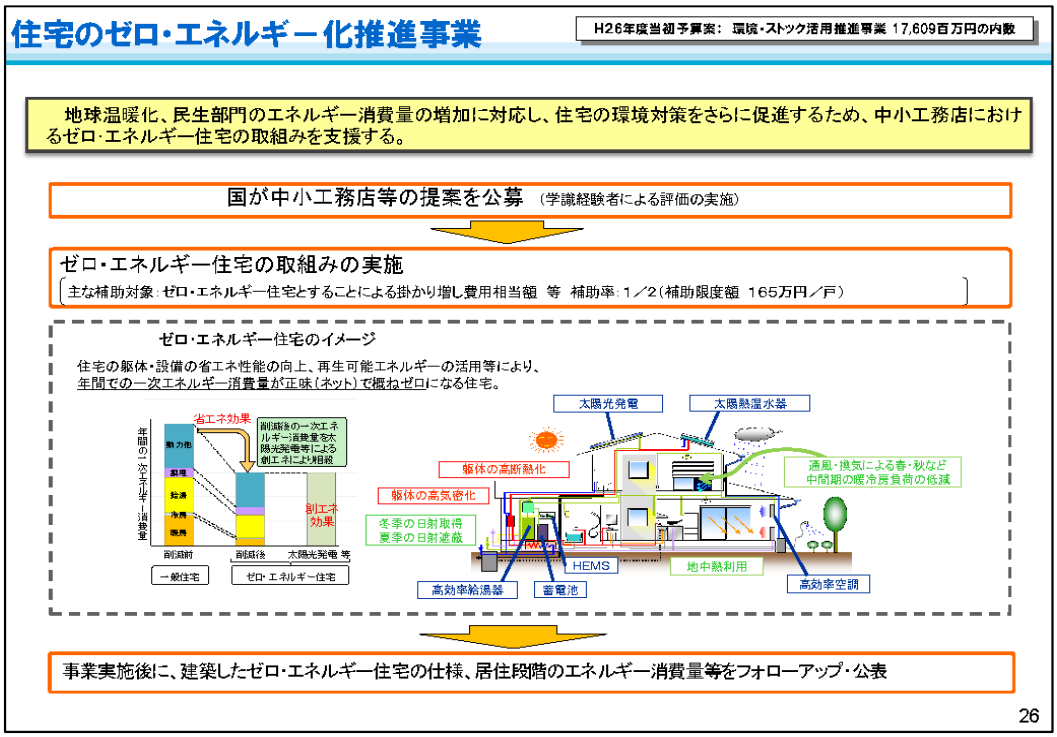
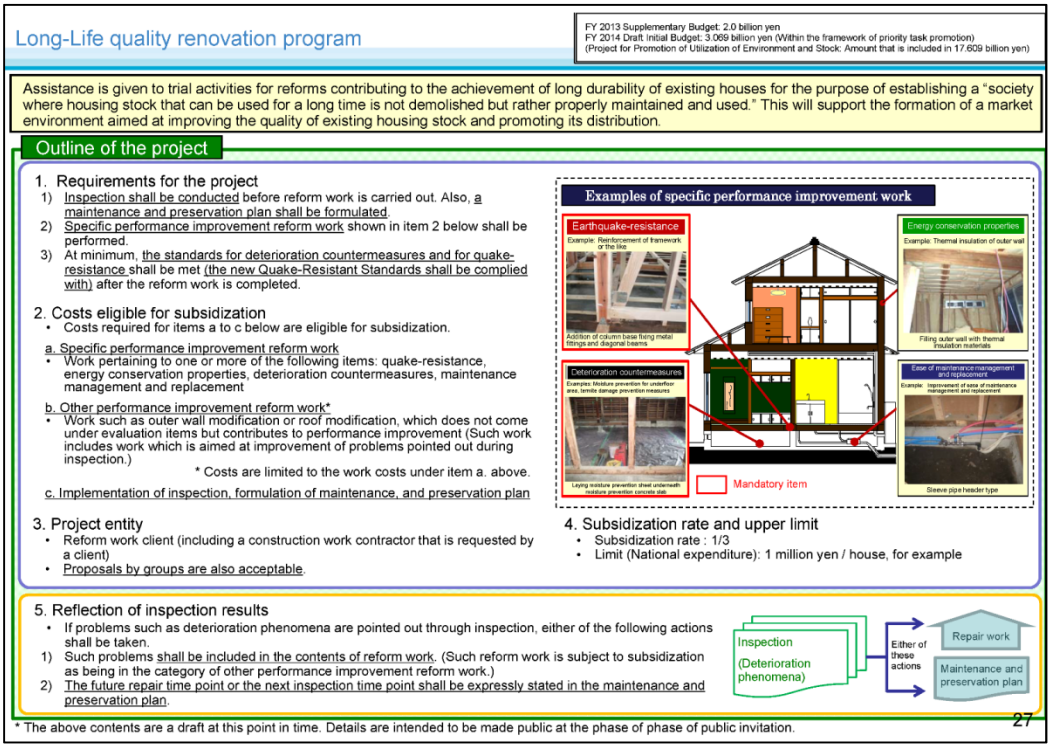
These slides outline the new loan, taxation, and subsidy systems for residential and non-residential buildings. And for renovation there are loans, tax-break systems and subsidies and there are other systems for newly-built buildings as well, where they set rational goals of energy conservation performance.



For the standards concerning certification of low carbon buildings, for the buildings to benefit from the lower tax rates, primary energy consumption needs to be 10% less than the energy efficiency standards of the energy conservation law requirements.



Zero energy buildings also fall under the area of subsidies by MLIT by up to 1.65 million yen per application for SMEs.



These are the new systems to be launched under the supplementary budget of this year, and new year's regular budget, to promote longer life renovation for existing house stock. We have a law to promote longer life houses for the newly build homes, and we would want to set a law also for the existing housing stocks. Before setting a law, we are experimentally do projects by putting budget on this idea. In the concept of longer life housing, the level of insulation and energy conservation performance will be included in the criteria for evaluation. And this will be promoted as a package combined with the level of earthquake resistance and other factors, and we have a target to double the market size of the secondhand homes as well.

Ⅱ Responding to Issues

1 Control based on the Energy Conservation Law
2 Evaluation and indication of energy conservation performance
3 Provision of incentives
4 Others

国土交通省
Ministry of Land, Infrastructure, Transport and Tourism
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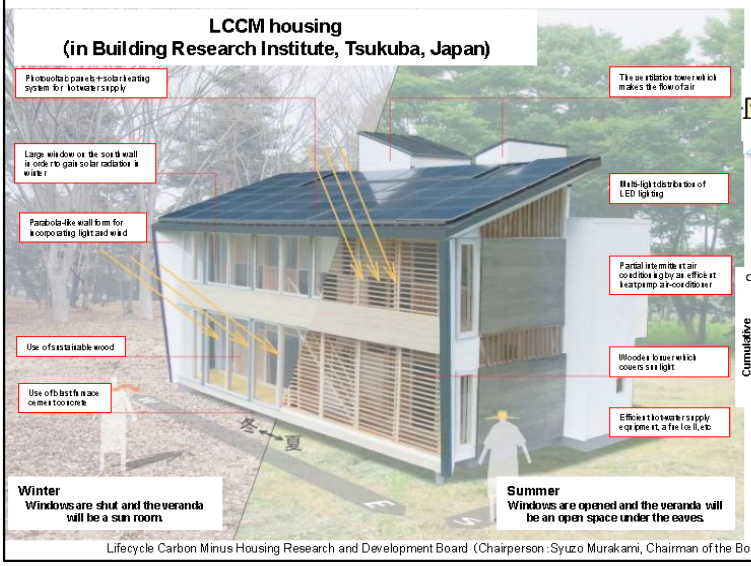
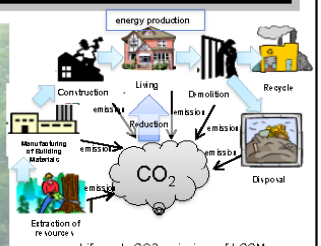
LCCM(Lifecycle carbon minus)housing

●By reducing CO2 emissions in stages of production of building materials, construction, and operation, and by improving durability, one can make life-cycle CO2 emissions from housing less than zero. Developing and promoting Life-Cycle Carbon Minus Housing will lead to the progress of fight against global warming.





Life cycle CO2 emissions of LCCM housing

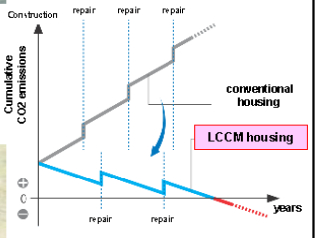


Image of Cumulative CO2 emissions through a life cycle of a house

Lifecycle Carbon Minus Housing Research and Development Board (Chairperson:Syuzo Murakami, Chairman of the Board of Directors of Building Research Institute
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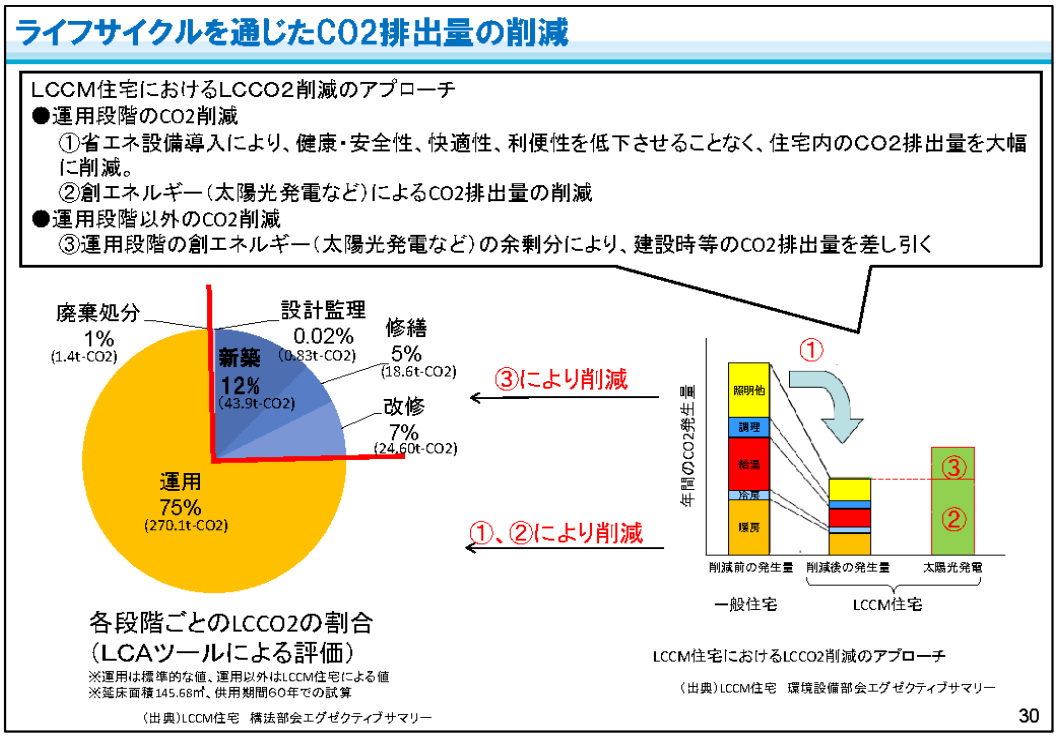

These are our future visions beyond zero energy houses. We are aiming at the level of life cycle carbon from home to be at the “minus” level. Life cycle includes during operation as well as the disposal phase of the houses. We wish to build a house that is net carbon minus in terms of emissions and with this I would like to close my presentation. Thank you very much for your attention.

Takase: Each ministries have their good policy and measures to achieve higher energy efficiency at homes. METI have the J-Credit to increase the economic aspect of the energy saving efforts, and the MOE is coming up with a new Household Energy Assessment scheme, and the MLIT has been setting standards for homes and non-residential buildings. From LCS we want, we think that there should be a policy that we could integrate all these efforts and as is written here, based on J-Credit we promoted a project for verification studies using the home energy assessment system so in the future we may be able to utilize this for the insulation of homes. So those are the proposals that we are making, and so, Professor Matsuhashi who is the director of our project will make his presentation, followed by the question and answer session.