



Financing Mechanisms for Europe's Buildings Renovation

Eurima Workshop Presentation



*Assessment and Structuring Recommendations for Funding
European 2020 Retrofit Targets.*

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As the name suggests, Climate Strategy is 100% focused on delivering first class Climate Change Strategy Consulting...

Peter Sweatman



- Engineer from Cambridge University
- 9 years at JPMorgan
- 5 years as Social Entrepreneur
- 5 years as MD for Iberia for Climate Change Capital
- Founder and CEO of Climate Strategy & Partners
- Clients include:



Company

Climate Strategy is a firm dedicated to addressing the opportunities and risks created by climate change. It currently acts in three areas:

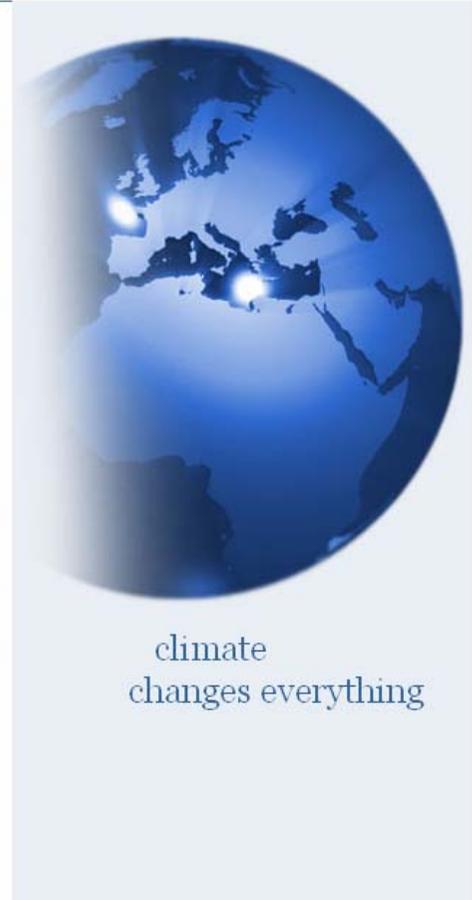
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2. **Proactive Partnerships:** Climate Strategy looks to accelerate the cross-border flows of resources, ideas and expertise in Clean Energy and Clean Technology through working with world class partners and leading climate solution providers in Iberia.
3. **Energy Efficiency Policy and Project Execution:** Climate Strategy has made energy efficiency a core competence across the firm as we are convinced that it is the single most interesting source of value and emission reductions in industry and in the built environment in the short term. Climate Strategy is currently working to support policy development and project execution in this area.

Climate Strategy looks to differentiate itself through its :

- **Sector Experience:** Our teams and partners bring a track record of excellence in relevant spheres.
- **Open Architecture:** Our business model embraces active partnerships with global solution providers and innovative market leaders.
- **Vibrant Networks:** Climate Strategy and its team members are regular contributors to energy, clean tech and climate fora on and offline.
- **Collaborative ICT Platform:** Climate Strategy's integrated approach to IT is designed to give greater resourcing flexibility and enhanced client service.
- **First Class Execution**

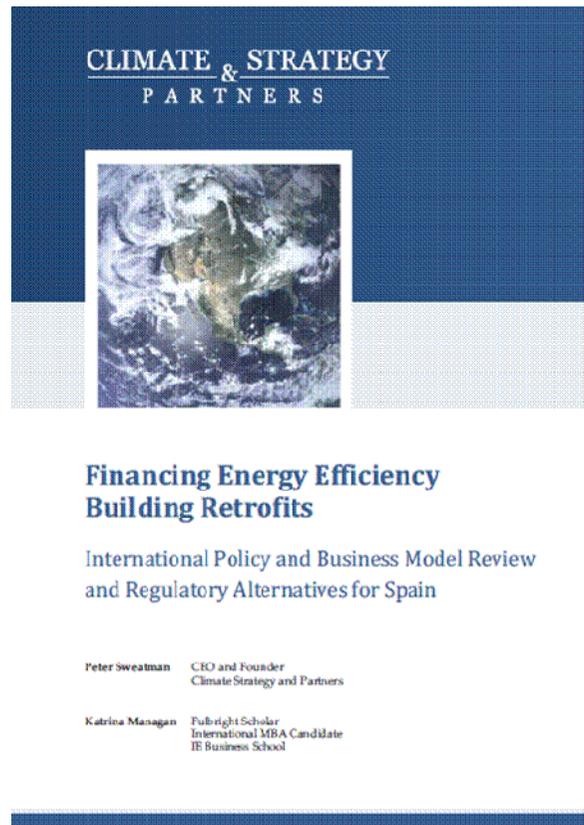
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Published Landmark Study on “Financing Energy Efficiency Building Retrofits” in October 2010

The following are notable stages in the study’s research and interview process



■ Extensive literary Review

- Built a database of around 120 relevant white papers, articles and pieces of legislation

■ Business Model and Financing Focus

- Policies analysed from the perspectives of stakeholders and impacts on business models

■ New Business Model Development

- By combining the best features of existing business models and policies we create the hybrid business model:
 - Aggregated Investments Model

■ 35 International Expert Reviewers

- Split equally across USA, UK and Spain
- Selected from areas of finance, policy, academia, energy and ESCO/retrofit
- 2 rounds of comments included in the final text

■ Assumptions, exclusions and scope limitations

Agenda

- 1 Financing Needs for European Buildings**
- 2 Existing Financing Mechanisms
- 3 Funding the Gap
- 4 Conclusion / What do we take away?

Europe's Current Policies and Financing are insufficient to reach 2020 Energy Efficiency Targets



Image Source: 123rf.com

Buildings are responsible for 40% of final energy use in Europe (photo of Madrid, Spain)

■ Europe's 2020 Energy Savings Target

- Established goal of cutting its annual primary energy consumption by 20% by 2020
- Reduce its CO₂ emissions by 780 million tonnes per annum
- Save Euro 100 billion in fuel costs per annum

■ Energy Efficiency Plan 2011

- Recognises that the EU is not on track to fully realize its cost-effective energy savings

■ Europe's Insufficient Progress: Why?

- Regulatory failures
 - Lack of comprehensive policy frameworks, poor enforcement and low levels of ambition
- Market Failures
 - Insufficient price signals, split incentives, asymmetric information, missing or incomplete markets and high initial costs

Europe needs to invest c. Euro 100 billion per annum in Buildings Energy Refurbishment from 2012-2020



Image Source: smallbiztrends.com

“While there are many regulatory proposals aimed at filling the policy gap identified by the Energy Efficiency Plan 2011, there have been fewer attempts made to quantify and resolve the commensurate and considerable financing gap.”

■ Solving Regulatory and Market Failures: Methodology

- An accurate view of the size of the financing needs for European buildings
- A clear pathway towards securing them in the timeframe required
- An adequate mix of public and private finance

■ “Three Methodologies” + Their Investment Figures

- **Bottom-up Approach: f_n (# Retrofits x Value)**
 - Annual European investment capital budget range of Euro 50 billion to Euro 180 billion
- **Top-down Using the IEA’s 2050 GHG targets**
 - Annual investment figure for buildings in the EU27 countries of Euro 110 billion each year until 2050
- **Procurement and Development Cost Approach**
 - Total cost of Low Carbon Technologies by 2020 of Euro 2.9 trillion, from which Buildings require a total 2011-2020 procurement and development cost of Euro 600 billion (approximately Euro 67 per annum).

At a country level, the EU Investment Target is consistent with 0.5-0.8% GDP Investment Annually



Image source: <http://ec.europa.eu>

*“Our **methodologies** allow us to determine an order of magnitude investment capital figure for European buildings which, through the use of existing successful national financing models, allows us to develop a European financing framework which can scale to deliver levels of national retrofit activity required to meet **Europe’s 2020 energy efficiency targets.**”*

■ Appropriate “Order of Magnitude”

- Investment required in European buildings between now and 2020 is Euro 100 billion per annum.
- In the context of the EU 27 2010 gross GDP, the figure is 12 trillion
 - This implies an approximate annual investment into energy efficiency in buildings on average per country of just over 0.8% of gross GDP to deliver Euro 100-150 billion in annual savings by 2020.

■ Cross-Check of Comparable Research

- The figures above are consistent with **Mckinsey’s** work on the capture of NPV - positive savings in the USA:
 - At a minimum, the US should be investing approximately \$67-79 billion (c. 0.5% of US GDP) per annum in building energy efficiency measures
- And coincides with **UNEP’s** 2010 research which calls for annual investment of \$308 billion in green buildings globally (0.5% of 2010’s global GDP) until 2050

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- 2 **Existing Financing Mechanisms**
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Image Source: kleanindustries.com

Buildings Investment Capital comes from Six Sources and in Eight Instrument Categories

“In 2010, EuroACE identified in excess of 100 financial or fiscal instruments which were in place across Europe which represented a total investment in the order of tens of billions of Euros

One of the most important roles of Government Policy is to lever private capital to invest alongside its own orders of magnitude which reach 0.5-0.8% GDP every year from now until 2020”

■ Sources of Capital

- Government, Building Owner, Building Occupier, Bank, Renovation Contractor and Energy Supplier
- Availability of Capital depends on:
 - The source’s access to and cost of funds
 - Perception of the risk / return characteristics of the renovation investment
 - Other competing investment priorities

■ Instrument Categories

- Preferential Loans, Subsidies, Grants, Third Party financing, Trading (White/Energy Certificates), Tax Rebates, Tax Deductions and VAT Reductions

■ Key Role of Government

- Government - through appropriate policies can significantly impact each of the private sector funding source’s investment priorities perception of the risk / return characteristics of the investment and potentially also access to and cost of funds

Case Study: Germany and the KfW – Catalysing the on lending by Banks to Refurbish Client Buildings

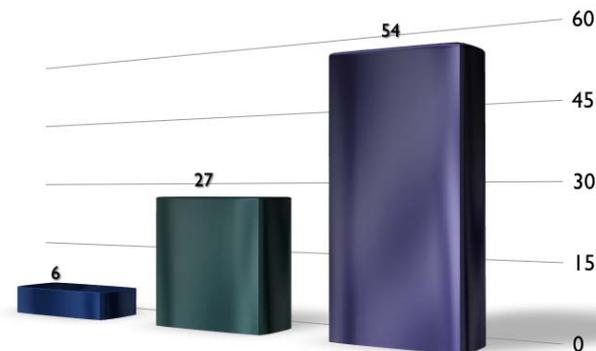


Image source: 123rf.com

*“This **“waterfall effect”** was created through several positive design features of KfW’s programmes including their deployment through the networks of private banks ensuring broad reach, leveraging banks’ retail transaction processing capacities and their subsidized 2.75% interest rates.”*

■ Germany and the KfW

- Germany has achieved impressive co-financing ratios of public to total funding for energy efficiency retrofits which started at 1:4 until 2006, and subsequently increased to 1:9 through the introduction of new programs coordinated by state bank KfW.
- KfW – with Euro 6 billion of federal funds was able to deploy Euro 27 billion efficiency investment through program activity stimulating a total and private investment flow totalling Euro 54 billion, thus creating a “waterfall effect”.
- Germany currently refurbishes around 200,000 buildings a year (equating to c. 400,000 homes) and to date has retrofitted 9 million units to high energy for heating efficiency standards.
- With an observed average Euro 36,000 investment per home, this implies a total annual investment of Euro 36 billion (or 1.4% of German GDP).



Case Study: UK's Green Deal and GIB



Image source: rggi.org

*“The UK’s Green Investment Bank (GIB) anticipates and initial capital allocation of 3 billion from the UK Government which it anticipates to catalyse a further 15 billion of **green Infrastructure investment** over four years (an initial 1:5 leverage ratio).”*

■ The UK’s Green Deal and Green Investment Bank

- Starting in 2012 it anticipates the retrofit of over a million homes per annum. The Green Deal looks to provide a maximum of £10,000 investment capital per intervention and is expected to deliver aggregate investment in the region of £7bn- £11bn per year (0.5-0.7% of UK GDP) over 15 years.
- The UK government has committed to upgrade the efficiency of up to 14 million homes by 2020.
- To date the UK has provided direct subsidies of up to £3,500 to 2 million low income households under its Warm Front programme and starting in 2008, it introduced a white certificate program (CERT) requiring domestic energy suppliers to make CO2 savings investments in their costumers’ properties which has generated a further £5.5 billion of retrofit investment.

How a Green Investment Bank can stimulate private finance into UK Household Energy Refurbishment

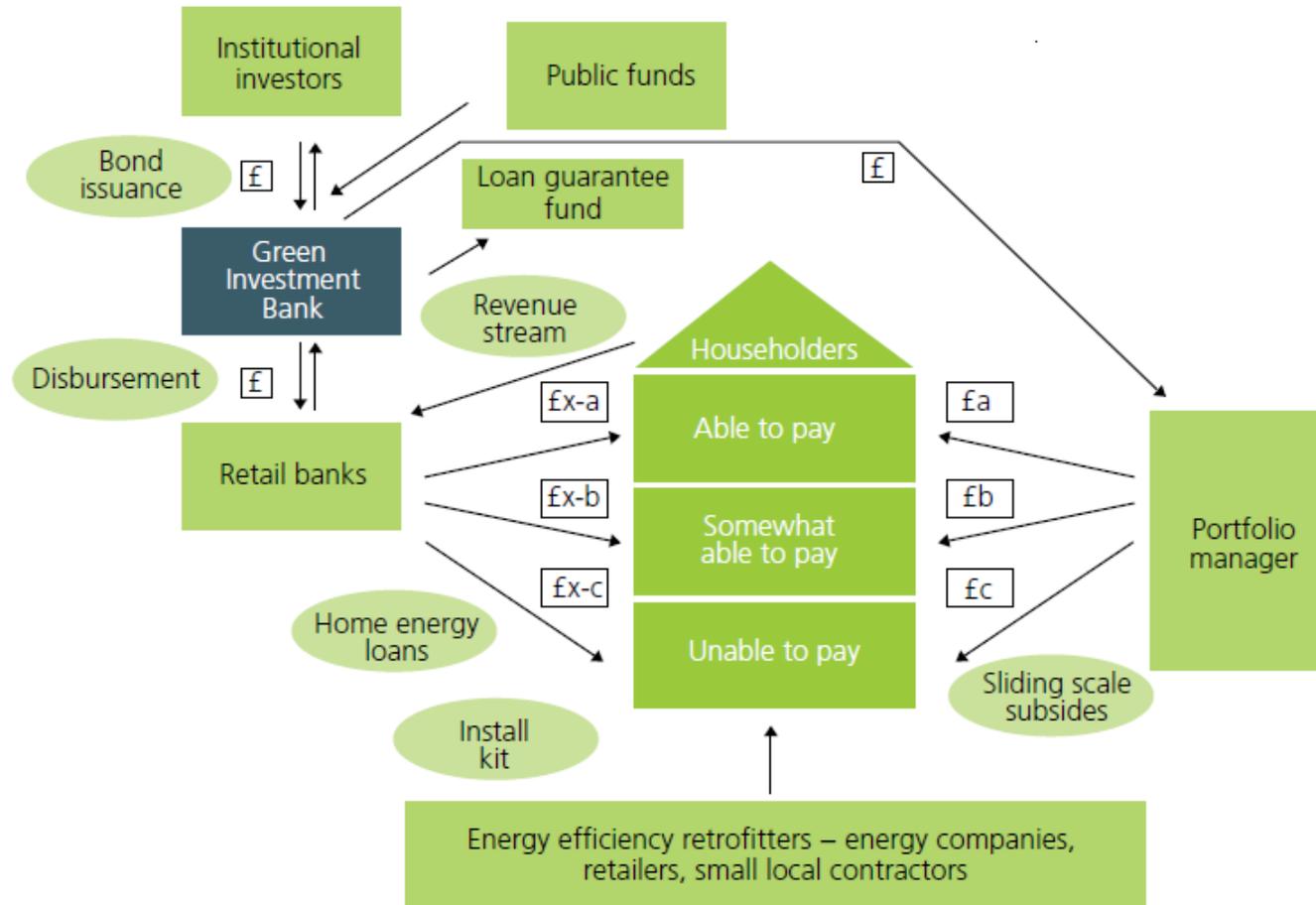


Image source: Green Investment Bank Commission Report



Image source: eib.org

European Level Capacity Building through ELENA



ELENA – European Local ENergy Assistance

“Created in order to facilitate the mobilisation of funds for investments in sustainable energy at local level, the European Commission and the European Investment Bank (EIB) have established the ELENA technical assistance facility. ELENA support covers up to 90% of the cost associated with technical assistance for preparation large sustainable energy investment programmes in cities and regions, which may also be eligible for EIB funding”

- Targets of 20-25x leverage
- The EU contribution can cover up to 90% of all eligible costs
- Investments Programmes Supported
 - Energy efficiency in public buildings
 - Development of solar energy in public buildings
- Province of Milan, Italy Project
 - Refurbishment of existing school buildings located in selected municipalities in the province through the tendering of standard contracts for energy performance contracting for selected groupings of public buildings. The projects will be financed by Financial Intermediaries (FIs) that will be selected by the province.
 - ELENA contribution: EUR 1,944,900
 - Investment mobilized: 90 Mio □
 - Leverage factor: 46

Summary of CS Prior EE “Business Model” Analysis

Business Model	Definition	Initial Investment Paid By	Limiting Factor	Investment Performance Responsibility	Regulatory Support		
					U.S.	U.K.	Spain
Owner Financed Model	Energy efficiency building retrofits financed with the building’s equity and managed by the building owner.	Building Owner	Owner’s Funds	Owner			
Utility Fixed Repayment Model	Energy efficiency building retrofit financed by a utility and paid for through fixed monthly payments.	Utility or Gvmt.	Regs.	No One			
Energy Performance Model	Energy Service Company (ESCO) finances the energy efficiency retrofit and is paid back from energy bill savings.	Energy Service Provider	Energy Service Provider Balance Sheet	Energy Service Provider			

Stakeholders: Primary Economic Interests Must be Aligned

	Stakeholder
Client	Building owner
	Building occupant
Finance	Equity funder
	Debt providing bank
Utility	Power Generator
	Power Distributor
	Electricity Retailer
	Gas Provider
	Energy retrofit provider
	Government

Challenges: Must be Overcome

	Challenge	Can a Good Business Model Fix This?	Can Good Policy Fix This?
Structural	Fragmented Market/ Aggregation Challenge	Yes	No
	Change in Ownership or Tenancy	Yes	Yes
	Agent Problems	Partially	Partially
	Regulatory Distortions	No	Yes
Financial	Cherry Picking	Partially	Yes
	Changes in Energy Needs	Partially	Partially
	High Hurdle Rate Return requirements	Yes	Yes
Behavioral	Information and Awareness	Yes	Yes
	Non-economic Decisions	Yes	Yes
	The Rebound Effect	No	Partially

Existing Business Models: Meet just 1/3 of Stakeholder's Interests

	Stakeholder	Owner Financed Model	Utility Fixed Repayment Model	Energy Performance Model	
Client	Building owner				
	Building occupant				
Finance	Equity funder				No Interests Met
	Debt providing bank				Most Interests not met
Utility	Power Generator				Interests partially met, or depends on circumstance
	Power Distributor				
	Electricity Retailer				
	Gas provider				Interests mostly met
	Energy retrofit provider				Interests all met
	Government				
Average Success		10%	33%	33%	

Existing Business Models: Address just 1/3 of Challenges

	Challenge	Owner Financed Model	Utility Fixed Repayment Model	Energy Performance Model
Structural	Fragmented Market/ Aggregation Challenge	○	◐	◑
	Change in Ownership or Tenancy	◑	◐	◑
	Agent Problems	○	◑	◐
	Regulatory Distortions	○	○	○
Financial	Cherry Picking	◐	○	◑
	Changes in Energy Needs	○	○	◐
	High Hurdle Rate Return requirements	◑	◐	◐
Behavioral	Information and Awareness	◑	◐	◐
	Non-economic Decisions	○	◐	◑
	The Rebound Effect	○	○	◐
	Average Success	13%	33%	37.5%

○ Not addressed

◐ Mostly not addressed

◑ Partially addressed

● Mostly addressed

● Completely addressed

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The Financing Gap for European Buildings is in excess of Euro 50 billion per annum



Image source: imagineclinic.com

“To meet Europe’s 2020 targets, the amount of additional financing required from all sources, public and private for energy efficiency retrofits in buildings is over Euro 50 billion annually.”

■ Financing Required

- Members States’ energy efficiency refurbishment policies and programmes should focus on three areas:

The removal of regulatory and non-economic hurdles

The alignment of the economic interests of the five principle non-Governmental

financial actors:

**Building Owners,
Building Occupiers,
Banks,
Refurbishment
Contractors and
Energy Suppliers in
delivering target
levels of retrofit
activity**

The inclusion and adequate capitalisation of financing facilities structured similarly to those of Germany or the UK which can lever Member State public funding by factors of up to 10 times



All Potential Sources of Value **MUST** be contemplated in the Financing and Policy Solutions

Image source: bestgreenhometips.com

“Refurbishment activity can be driven by any one, or a combination, of these three value sources: Energy savings (classic ESCO activity), implied emissions reductions (white certificate programs like the UK’s CRC Energy Efficiency Scheme) or the other material improvements (eg. Commercial property refurbishments which include improved energy performance alongside a more sizeable general renovation).”

■ Value Framework and Economic Incentive

- In the context of a building retrofit, there are three key sources of value:

Energy savings

Implied emissions reductions

Other material improvements (sometimes referred to as “co-benefits”)



Image source: guardian.co.uk

Levels of Engagement can be Increased and Value Frameworks made more Consistent with 2020 targets

The following table provides a simplified overview of the existing levels of retrofit engagement

	Energy Savings	Implied Emissions Reductions	Other Material Improvements	Engagement Score
Building Owners	1 Connect building energy performance to property value and establish transparent standards	0 Add emissions dimension to energy performance and establish transparent standards	2 Material improvements to building quality impact building value and marketability	50%
Building Occupiers	2 Reduce the risk of retrofit energy performance and lower cost of funds	1 Introduce white certificate programmes to prioritize EE retrofits	2 Material improvements make building occupancy more appealing	83%
Banks	1 Improve access to low-cost financing and engage as distribution channel for retrofit	0 Make Emissions Reductions an Additional Source of Cashflow to Retrofit	1 Material Improvements Increase Building Value as Collateral	33%
Refurbishment Contractor	1 Capacity Building, Quality Standards, Accreditation and Energy Performance Based Contracting	0 Place a Value on Emissions Reductions and Integrate into Refurbishment Activity	2 More Other Material Improvement Increases the Scope and Size of the Refurbishment Work	50%
Energy Suppliers	0 Improve Access to Low-Cost Financing and Engage as Distribution Channel for Retrofits	1 White Certificate Programs and Placing a Realizable Value on Emissions Reductions	0 Potential to Stimulate Longer-term Customer Engagement	17%
Overall Driver Score	50%	20%	70%	

Solution 1: Open Low Cost Funding Channels for the Building Occupant



Image source: pinkcaddiecoach.com

“These key features identified in the existing financial value-framework for energy efficiency renovations will lead to sub-optimal outcomes for Member States if they are not addressed by specific new policy measures on energy efficiency finance.”

■ Unlocking Greater Amounts of Funding

- Remedial Policy Alternatives. How can they be achieved?

1

Lower Cost and Better Access to Energy Efficiency Financing for Building Occupant

- On-bill Finance:** Including energy efficient retrofit repayments in energy bills and attaching them to the property itself raises the seniority of those payments and should remove them from the relatively high-cost world of consumer finance
- Accreditation, Quality Assurance and Standards:** Ensuring that the energy efficiency retrofit work is undertaken by an accredited provider, meeting high quality standards through standardized contracts and procedures de-risks the investment in the resulting energy savings.
- Credit Support:** The commercial guarantees of ESCOs with large balance sheets, high credit ratings and solid brands makes energy efficiency retrofits more “bankable” as would the provision of various forms of credit support and enhancements from Government agencies directed at certain population segments or specific compliant retrofit activities.



Image source: americanprogress.org

Solution 2: Explicit Value for the Emissions reductions

■ Unlocking Greater Amounts of Funding

“In many countries the only stakeholder able to perceive economic (and strategic) value from the greenhouse gas (GHG) emissions reductions resulting from greater energy efficiency retrofit activity is the State whose national emissions totals will decrease, whose net energy balance will improve and whose probability of reaching national emissions reductions targets increases.”

2

Placing an Explicit Value on Implied Greenhouse Gas Emissions Reductions

- a. **White Certificate Schemes:** White certificate compliance schemes have been widely used in the energy sector in Europe to integrate externalities and national targets into the activities of this highly regulated business and are already used in the US and several Member States to promote greater energy efficiency activity.
- b. **Government Funding Schemes:** Directly or indirectly national governments can support energy efficiency retrofit activity in their built environment by placing an economic value on the greenhouse gas emissions reductions which result.

Solution 3: Increase Incentives for Banks and Energy Suppliers to Engage



Image source: onphilanthropy.com

“Potentially banks and energy suppliers have competing retail product whose customer demand, limited complexity and profit characteristics make them presently more attractive to sell to their customers than energy efficiency retrofit solutions.”

■ Unlocking Greater Amounts of Funding

3

Greater Engagement of Banks and Energy Suppliers in Aggregation, Execution and Finance of Energy Efficiency Retrofits

- a. **De-risk the Underlying Transaction:** Improving the transaction’s creditworthiness, simplifying the contracting and repayment mechanisms and enhancing the quality of the execution of the energy efficiency retrofit
- b. **Improving the Economics of Retrofits:** The addition of value for the emissions reduced, imposition of a new CO₂ or energy tax and the removal of distorting energy subsidies
- c. **Co-financing or Risk Sharing in the Transaction:** Government programs can part or fully finance energy efficiency retrofit transactions, offer subsidized interest rates and placement fees to bank or utility distribution networks for sale and transaction processing services.
- d. **Significantly Increase Customer Demand:** Retail distribution networks can be more “reactive” than “proactive” and hence the success of Government led education programmes, mandatory buildings energy performance certification, awareness campaigns and customer fiscal incentives should significantly increase customer demand and the size of the opportunity.

Solution 4: Capacity Build Standards, Processes, Contracts and Procedures



Image Source: kleanindustries.com

“Significant work has been done by various countries and stakeholder groups to trial, prototype, pilot, test, assess, review and experiment with a wide variety of energy efficiency programmes, financial instruments and technology solutions for buildings retrofits. “

■ Unlocking Greater Amounts of Funding

4

Focused Public Investment in specific Capacity Building, Programme Design, Technical Support, Knowledge Sharing and Education

- a. **Production of “Best in Class” Guidelines and Templates for Specific Retrofit Activities:** Best practice should be shared, along with forms of contracting, verification, tender process, counterparty selection, successes and failures to ensure that State, local and regional authorities have full access to appropriate detail to facilitate their confident execution of these programmes.
- b. **Increased Funding to support the Streamlining of Public Contracting and Processes, e.g. EIB’s ELENA facility:** The preparation, processes, contracting, monitoring and verification for energy efficiency retrofits of public buildings is important and is funding which receives good leverage ratios due to the subsequent investments provided by the winning ESCO and – in well executed tenders – a significant reduction in the friction costs borne by the tendering parties.
- c. **Raise the Profile of the Non-Financial co-Benefits of Optimal Energy Efficiency Retrofits:** There are significant non-financial yet material co-benefits delivered through the execution of an optimal energy efficiency retrofit including enhanced health and comfort, increased productivity and improved standards of living.

Policies and Finance go “hand in hand” and 10x leverage can only be achieved with Strong Alignment



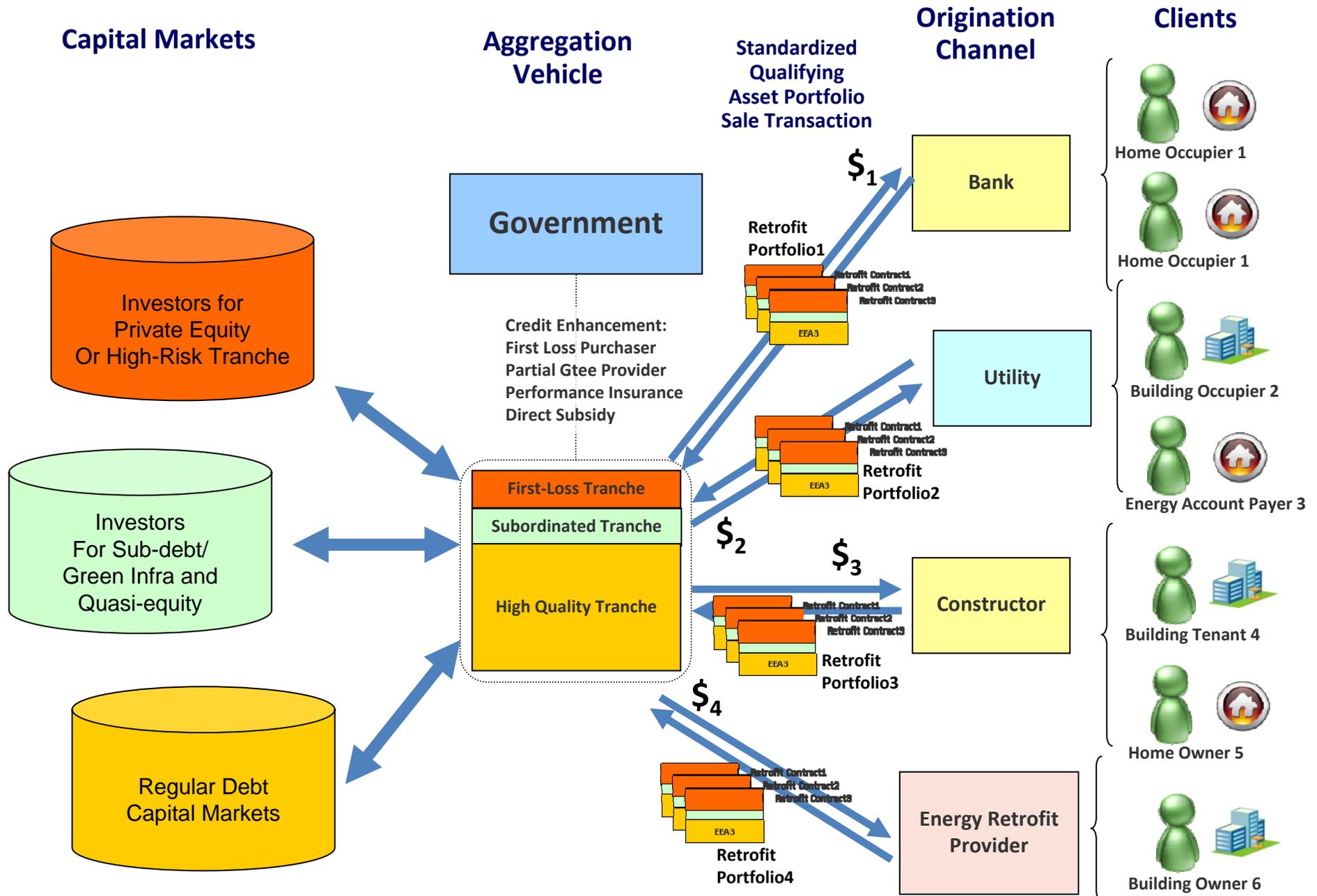
Image source: mustknowinvesting.com

“From a structuring perspective, we believe that, independently of originating channel (Bank, ESCO, Energy supplier), the broad primary source of capital (debt capital markets) required for such significant sums are those which can guarantee the most permanent access to such low cost funding”

■ Successful Polices

- If successful policies and programmes are implemented, the total amount of energy efficiency activity funded in Europe by 2020-25 could reach to Euro 1 trillion.
- If levered 1:10, this implies Euro 100 billion of public funding together with Euro 900 billion of private sector co-funding.
 - Equivalent to 15% of the total EU27 residential mortgage market in 2008.
 - Of similar magnitude to the expected energy infrastructure investments required of European Utilities.
- It is imperative to use of Government “policy bank” balance sheets (eg. KfW) and the need for the development of a robust securitization funding route for energy efficiency retrofit asset portfolios allowing banks, and other energy efficiency retrofit originators, to source the relevant amounts of funding at required low costs.

Aggregated Investments Model



	Challenge	Aggregated Investment Model's Ability to Address Challenges
Structural	Fragmented Market/Aggregation Challenge	●
	Change in Ownership or Tenancy	◐
	Agent Problems	◐
	Regulatory Distortions	○
Financial	Cherry Picking	◐
	Changes in Energy Needs	◐
	High Hurdle Rate Return requirements	◐
Behavioral	Information and Awareness	◐
	Non-economic Decisions	◐
	The Rebound Effect	◐
Average Success		57.25%

Aggregated Investments Model:

- Finds market momentum
- Passes the tipping point to success

Average Success 59%

	Stakeholder	Aggregated Investment Model's Ability to Meet Stakeholder's Interests	
Client	Building owner	●	
	Building occupant	◐	
Finance	Equity funder	◐	
	Debt providing bank	◐	
Utility	Power Generator	○	
	Power Distributor	◐	
	Electricity Retailer	◐	
	Gas provider	◐	
	Energy retrofit provider	◐	
	Government	◐	
	Average Success		60%

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Conclusion / What do we take away?



Image source: blog.betterbottomline.com

“This significant financing gap can only be filled with adequate and coordinated policy frameworks with subsidy programs designed to align stakeholder interests, facilitate execution and, most importantly, engage key private sector actors in the wide scale funding, distribution and sale of energy efficiency retrofit solutions to their customers.”

■ Meeting Europe’s 2020 Energy Savings Target

- The amounts of investment flows required are in the order of 0.5-0.8 % of GDP
 - Some Euro 100 billion in aggregate across Europe and more than double today’s investment rates

■ German and UK Examples

- Germany’s KfW having stimulated a total investment of Euro 54 billion from 2006-2009 from a core public subsidy of Euro 6 billion (1:9 lever)
- UK’s Green Deal - with a target investment rates of 0.5-0.7% of UK GDP, its active wholesale leverage for direct public finance solutions appears to lie between 1:4 to 1:9

■ EIB’s ELENA Program

- Anticipated leverage capacity building and technical support grants is targeted at 1:25

■ Private Sector Actors / Private Sector Co-financing

- Can complement new “best in class” public funding programmes, and create a “waterfall effect” of financing sources