

IL PROBLEMA ENERGETICO E LA PIANIFICAZIONE

Primo Meeting con i Multiplier

Roma 20 Marzo 2014

ALBERTO FICHERA



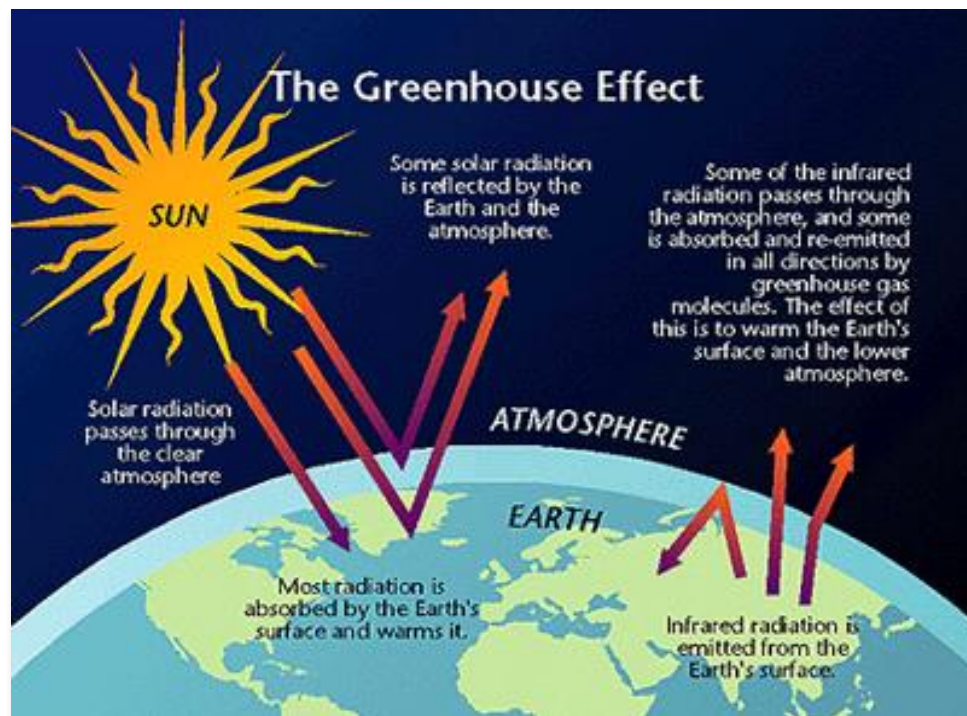
Anni '70 il problema energetico è politico



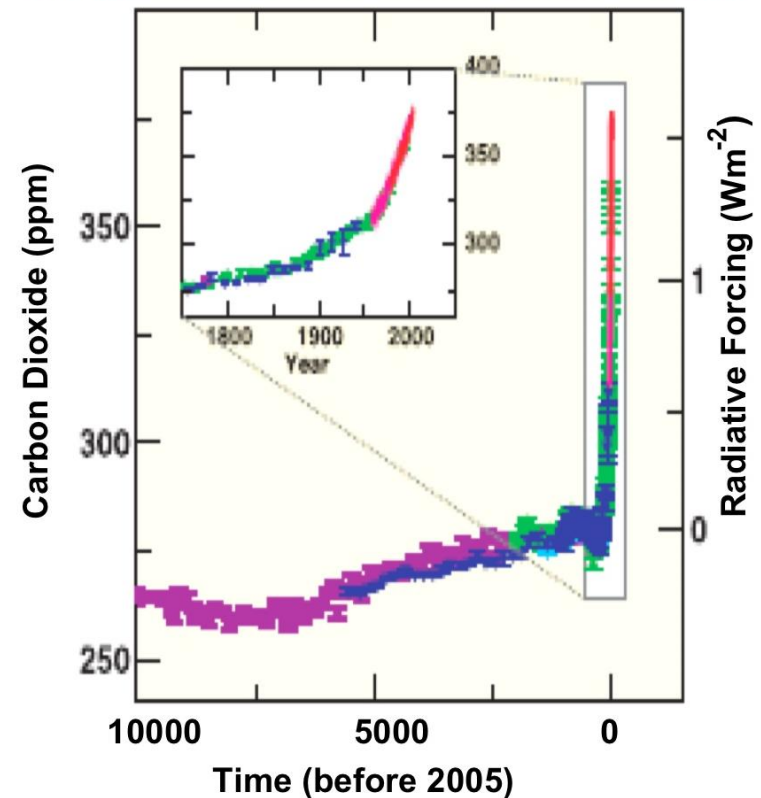
Anni '70 il problema ambientale è
limitato all'inquinamento



Anni '90 il problema energetico e quello ambientale si integrano



Changes in CO₂ from ice core and modern data



Anni '90 il problema energetico e quello ambientale si integrano



Energy
Supply



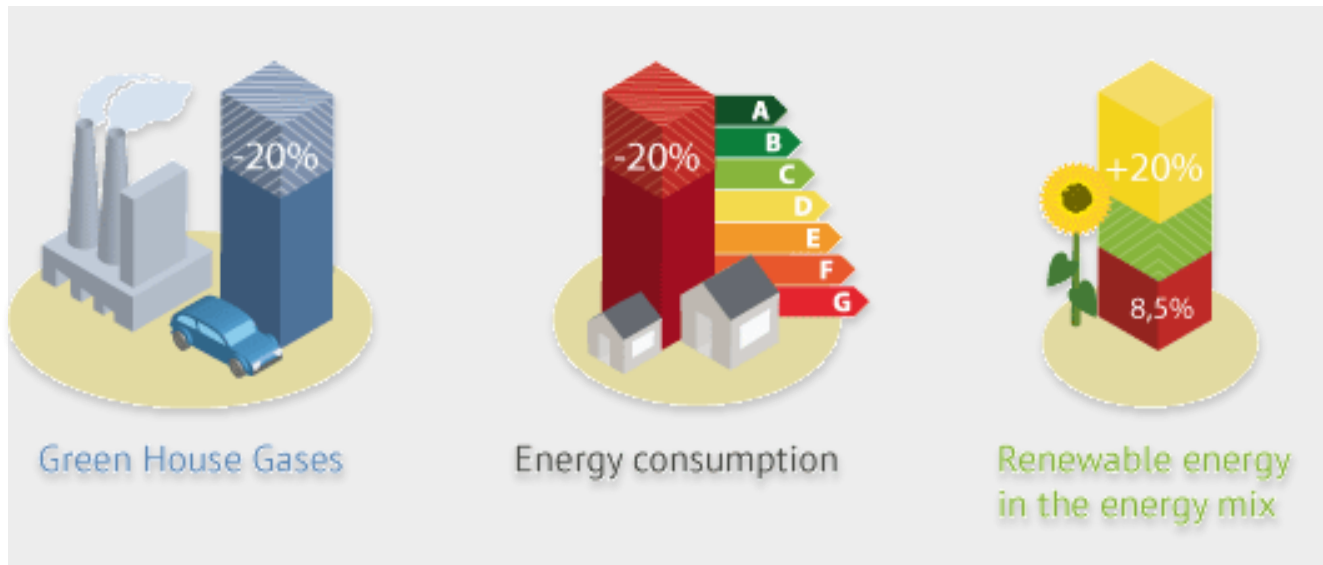
Transport



Buildings

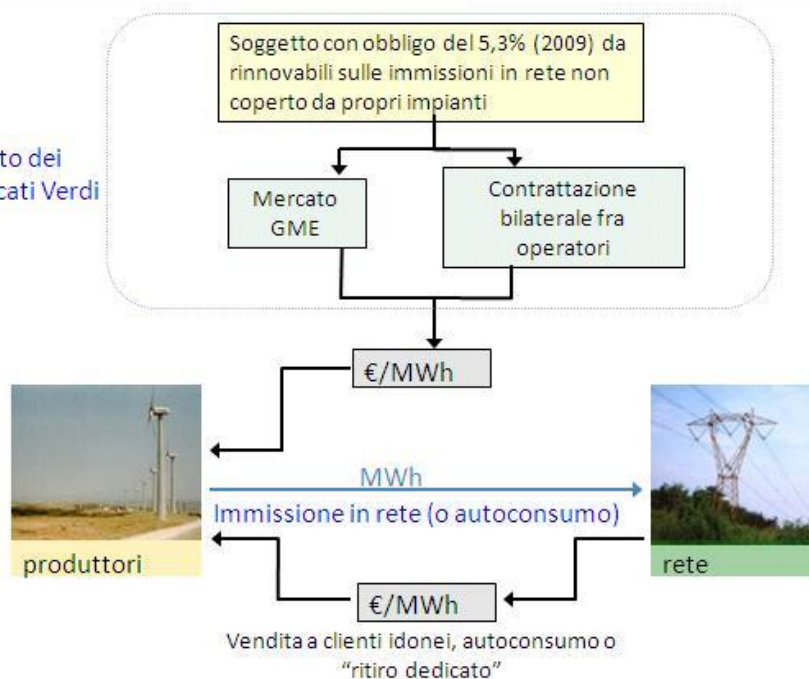


In Europa la Direttiva Europea 20-20-20

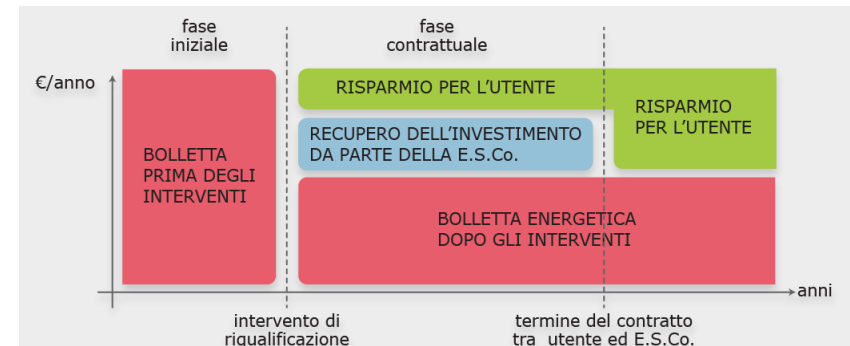
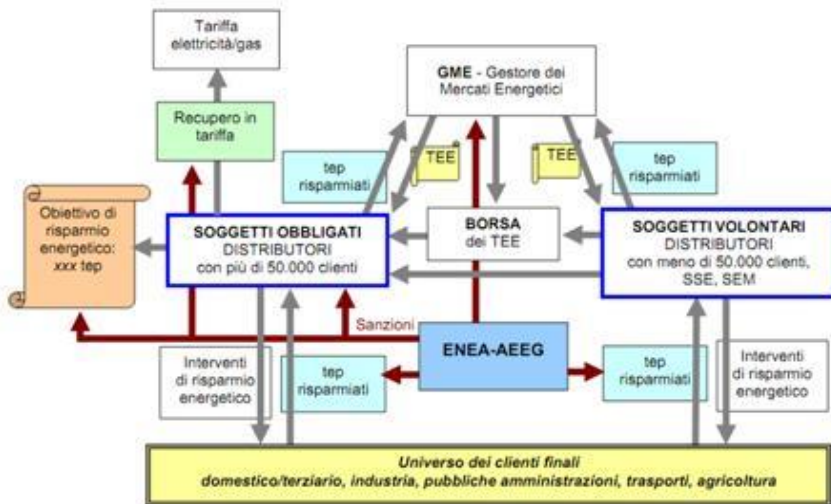


In Italia nel 1999 il Decreto Bersani sulla produzione da Fonti rinnovabili

Mercato dei
Certificati Verdi



In Italia nel 2004 la norma sull'Efficienza Energetica



In Italia nel 2005 il Conto Energia per l'incentivazione di produzione di energia elettrica da fotovoltaico



In Italia dal 2007 la detrazione fiscale per interventi di riqualificazione energetica degli edifici

Impianto di riscaldamento autonomo interno (purché conforme al DM 37/2008 - ex legge 46/90)	Nuovo impianto, senza opere edilizie Nuovo impianto con opere edilizie esterne (canna fumaria e/o altre opere interne o esterne) per riscaldamento o ventilazione Riparazioni con ammodernamenti e/o innovazioni
Impianto elettrico	Sostituzione dell'impianto o integrazione per messa a norma
Impianto idraulico	Sostituzione o riparazione con innovazioni rispetto al preesistente
Inferriata fissa	Sostituzione con innovazioni rispetto alla situazione preesistente Nuova installazione con o senza opere esterne
Infissi esterni	Nuova installazione o sostituzione con altri aventi sagoma, materiali o colori diversi (solo se riguarda l'intera facciata)
Interruttore differenziale	Sostituzione o riparazione con innovazioni
Intonaci esterni facciata	Intonaci e tinteggiatura esterna con modifiche a materiali e/o colori

Scadenze obbligatorie dell'uso delle rinnovabili negli edifici

	RINNOVABILI TERMICHE: obbligo di soddisfacimento		RINNOVABILI ELETTRICHE: obbligo di soddisfacimento
	Fabbisogno per l'acqua calda	Fabbisogno per l'acqua calda+riscaldamento+raf frescameto	Potenza elettrica degli impianti alimentati da fonti rinnovabili
dal 1° giugno 2012	50%	20%	1 kW per ogni unità abitativa, 5kW per gli edifici industriali da 100 mq
		 Emilia-Romagna 35%	 Emilia-Romagna 1,2 kW+1kW per ogni unità abitativa
dal 1° gennaio 2014		35%	1,2 kW per ogni unità abi- tativa, 5kW per gli edifici industriali da 100 mq in su
dal 1° gennaio 2015		 Emilia-Romagna 50%	 Emilia-Romagna 1,6 kW+1kW per ogni unità abitativa
dal 1° gennaio 2017		50%	1,6 kW

Direttiva Europea
2012/27



Co-funded by the Intelligent Energy Europe
Programme of the European Union

Scadenze obbligatorie delle prestazioni energetiche degli edifici

2011 Obbligo per i nuovi edifici di prestazioni comprese tra la **Classe C** e la **Classe D** per la climatizzazione invernale

2019 Edifici pubblici a "**Energia quasi Zero**", il rimanente fabbisogno di energia deve essere soddisfatto con **energie rinnovabili**

2021 Vale anche per gli edifici **privati**

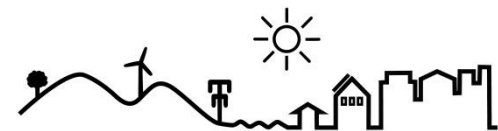
Direttiva Europea
2010/31





CeNSU

Centro Nazionale Studi Urbanistici



SPECIAL

SPATIAL PLANNING and ENERGY for
COMMUNITIES IN ALL LANDSCAPES

Pianificazione Energetica Urbana



**Patto dei
Sindaci**

Un impegno per
l'energia sostenibile

PAES

piano d'azione per l'energia sostenibile

LA SVOLTA ENERGETICA



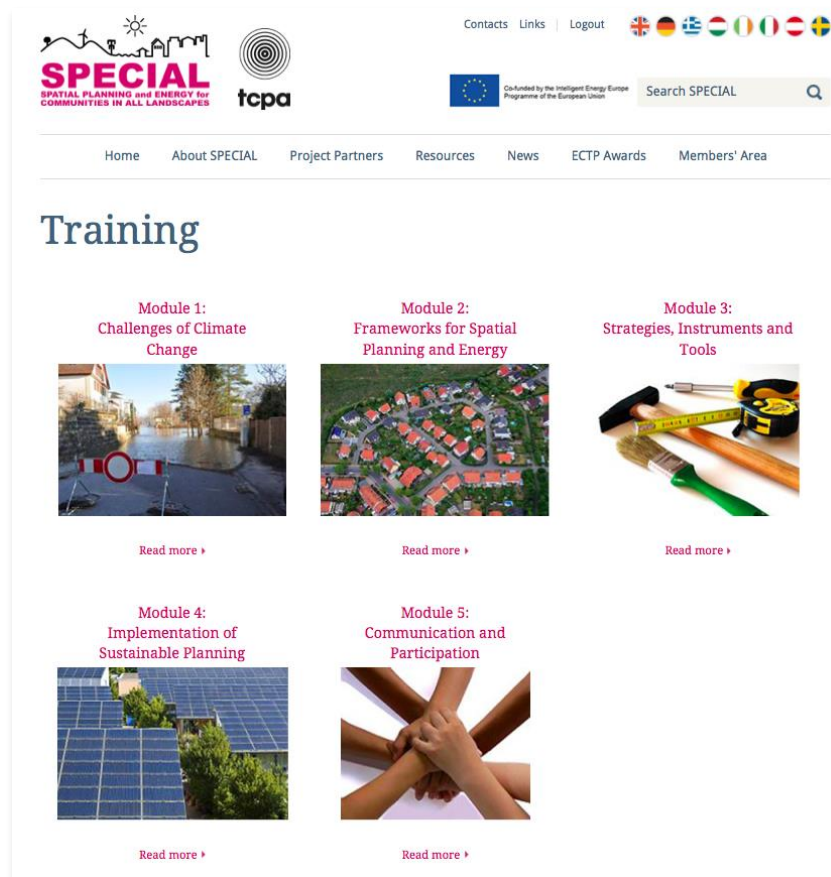
Co-funded by the Intelligent Energy Europe
Programme of the European Union

Pianificazione Energetica

Pianificazione del Territorio



Competenze per integrare la Pianificazione Urbana ed Energetica



The screenshot shows the SPECIAL website interface. At the top, there are navigation links: "Contacts", "Links", and "Logout". Below these are flags representing various European countries. The SPECIAL logo is prominently displayed, along with the text "Co-funded by the Intelligent Energy Europe Programme of the European Union". A search bar labeled "Search SPECIAL" is also present. The main navigation menu includes "Home", "About SPECIAL", "Project Partners", "Resources", "News", "ECTP Awards", and "Members' Area". The "Training" section is highlighted, featuring five modules with corresponding images and "Read more" links:

- Module 1: Challenges of Climate Change** (Image: Flooded street with a red and white barrier)
- Module 2: Frameworks for Spatial Planning and Energy** (Image: Aerial view of a residential neighborhood)
- Module 3: Strategies, Instruments and Tools** (Image: Construction tools including a tape measure, pencil, and brush)
- Module 4: Implementation of Sustainable Planning** (Image: Solar panels on a roof)
- Module 5: Communication and Participation** (Image: Hands clasped together in a circle)





Empowering Urban Energy Efficiency™

Type Your Address
 HEAT Map
 How It Works
 Why It Matters





City of Calgary

HEAT Score

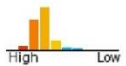


Max: 84 : Min: 32

Waste Heat Information (Gas): Killarney-Glenarry

Based on natural gas use, we estimate that **281** homes heat an area of **4.89x10⁵ sq.ft** and emit **1,889T** of CO₂e per year at a cost of **\$319,619**. By following HEAT recommendations, we estimate total community savings per year of **\$24,529** and a reduction of **145T** of CO₂e per year.

Score Distribution



High Low

Communities by HEAT Score

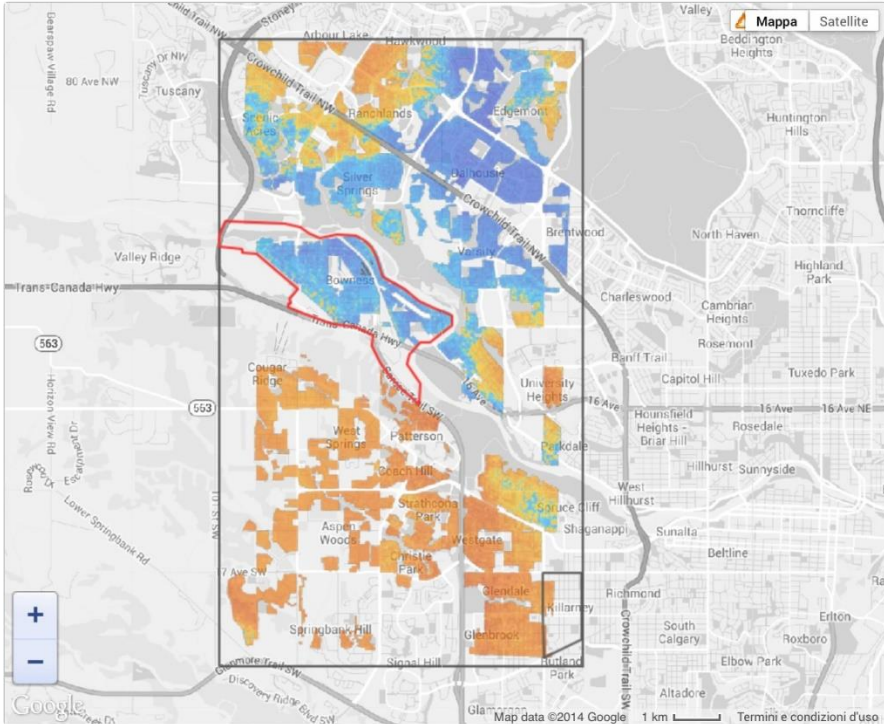
15. Arbour Lake	62
16. Rosscarrock	61
17. Wildwood	52
18. Hawkwood	47
19. Ranchlands	47
20. Parkdale	46
21. Montgomery	46
22. Spruce Cliff	46
23. Scenic Acres	45
24. Silver Springs	42
25. Edgemont	36
26. Varsity	34
27. Bowness	34
28. Brentwood	27
29. Dalhousie	25

Certified HEAT Solutions

Not sure what step to take next? Book a certified home energy audit with **4 Elements**.

Keep Your Heat In

For further information, check out [this guide](#) by Natural Resources Canada's Office of Energy Efficiency.



HEAT Score's represent single dwellings only

High Low

HEAT Score

Submitted Not Verified Verified

Home **HEAT Map** How It Works Why It Matters About FAQ Terms of Use

Copyright © G. J. Hay. All rights reserved.





HEAT Score

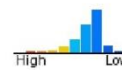
34

Max: 84 : Min: 9

Waste Heat Information (Gas): Bowness

Based on natural gas use, we estimate that **2,757** homes heat an area of **44,20x10^5** sq.ft and emit **17,086T** of CO₂e per year at a cost of **\$2,893,177**. By following HEAT recommendations, we estimate total community savings per year of **\$244,009** and a reduction of **1,441T** of CO₂e per year.

Score Distribution



Communities by HEAT Score ▼

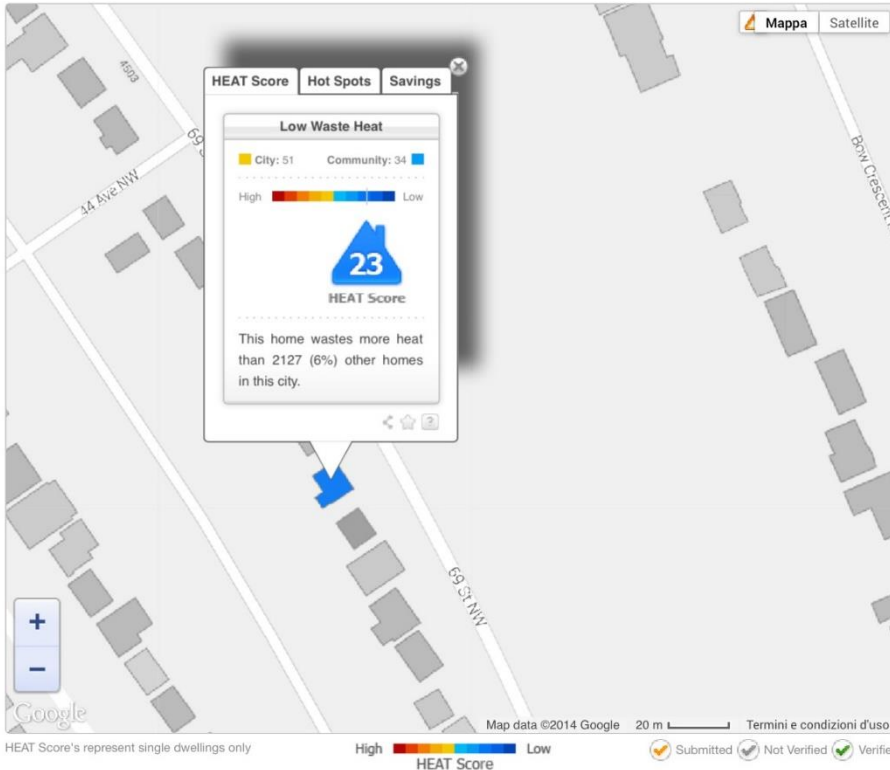
15. Arbour Lake	62
16. Rossarrock	61
17. Wildwood	52
18. Hawkwood	47
19. Ranchlands	47
20. Parkdale	46
21. Montgomery	46
22. Spruce Cliff	46
23. Scenic Acres	45
24. Silver Springs	42
25. Edgemont	36
34. Varsity	34
27. Bowness	34
28. Brentwood	27
29. Dalhousie	25

Certified HEAT Solutions

Not sure what step to take next? Book a certified home energy audit with **4 Elements**.

Keep Your Heat In

For further information, check out [this guide](#) by Natural Resources Canada's Office of Energy Efficiency.




HEAT™
 Empowering Urban Energy Efficiency™

Type Your Address **HEAT Map** How It Works Why It Matters





City of Calgary

HEAT Score

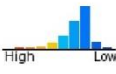
34

Max: 84 | Min: 9

Waste Heat Information (Gas): Bowness

Based on natural gas use, we estimate that 2,757 homes heat an area of 44,20x10^5 sq.ft and emit 17,086T of CO2e per year at a cost of \$2,893,177. By following HEAT recommendations, we estimate total community savings per year of \$244,009 and a reduction of 1,441T of CO2e per year.

Score Distribution



Communities by HEAT Score

15. Arbour Lake	62
16. Rosscarrock	61
17. Wildwood	52
18. Hawkwood	47
19. Ranchlands	47
20. Parkdale	46
21. Montgomery	46
22. Spruce Cliff	46
23. Scenic Acres	45
24. Silver Springs	42
25. Edgemont	36
26. Varsity	34
27. Bowness	34
28. Brentwood	27
29. Dalhousie	25

Certified HEAT Solutions

Not sure what step to take next? Book a certified home energy audit with 4 Elements.

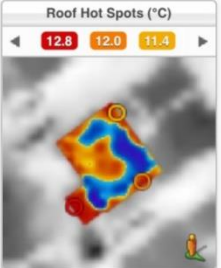
Keep Your Heat In

For further information, check out [this guide](#) by Natural Resources Canada's Office of Energy Efficiency.

HEAT Score **Hot Spots** **Savings**

Roof Hot Spots (°C)

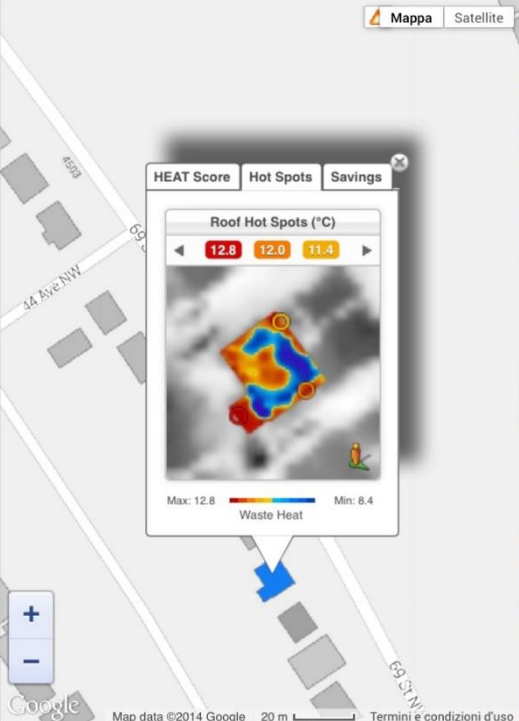
12.8 12.0 11.4



Max: 12.8 Min: 8.4

Waste Heat

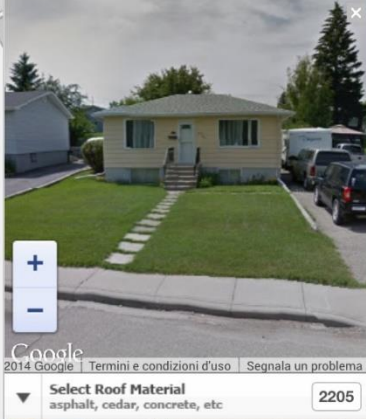
Map **Satellite**



HEAT Score's represent single dwellings only

High Low

HEAT Score



2014 Google | Termini e condizioni d'uso | Segnala un problema

Select Roof Material
 asphalt, cedar, concrete, etc

2205

Move & Click

Submitted Not Verified Verified




HEATTM Empowering Urban Energy EfficiencyTM

[Type Your Address](#)
[HEAT Map](#)
[How It Works](#)
[Why It Matters](#)





City of Calgary

HEAT Score

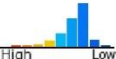


Max: 84 : Min: 9

Waste Heat Information (Gas): Bowness

Based on natural gas use, we estimate that 2,757 homes heat an area of 44.20x10⁵ sq.ft and emit 17,086T of CO₂e per year at a cost of \$2,893,177. By following HEAT recommendations, we estimate total community savings per year of \$244,009 and a reduction of 1,441T of CO₂e per year.

Score Distribution



Communities by HEAT Score

15. Arbour Lake	62
16. Rosscarrock	61
17. Wildwood	52
18. Hawkwood	47
19. Ranchlands	47
20. Parkdale	46
21. Montgomery	46
22. Spruce Cliff	46
23. Scenic Acres	45
24. Silver Springs	42
25. Edgemont	36
26. Varsity	34
27. Bowness	34
28. Brentwood	27
29. Dalhousie	25

Certified HEAT Solutions

Not sure what step to take next? Book a certified home energy audit with 4 Elements.

Keep Your Heat In

For further information, check out [this guide](#) by Natural Resources Canada's Office of Energy Efficiency.

HEAT Score **Hot Spots** **Savings**

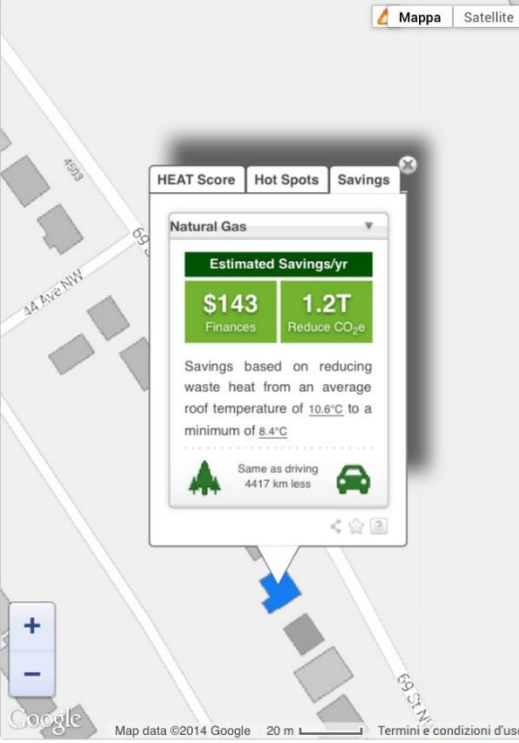
Natural Gas

Estimated Savings/yr

\$143 Finances **1.2T** Reduce CO₂e

Savings based on reducing waste heat from an average roof temperature of 10.6°C to a minimum of 8.4°C

Same as driving 4417 km less



Map data ©2014 Google 20 m

HEAT Score's represent single dwellings only

High  Low



Google 2014 Google Termini e condizioni d'uso Segnala un problema

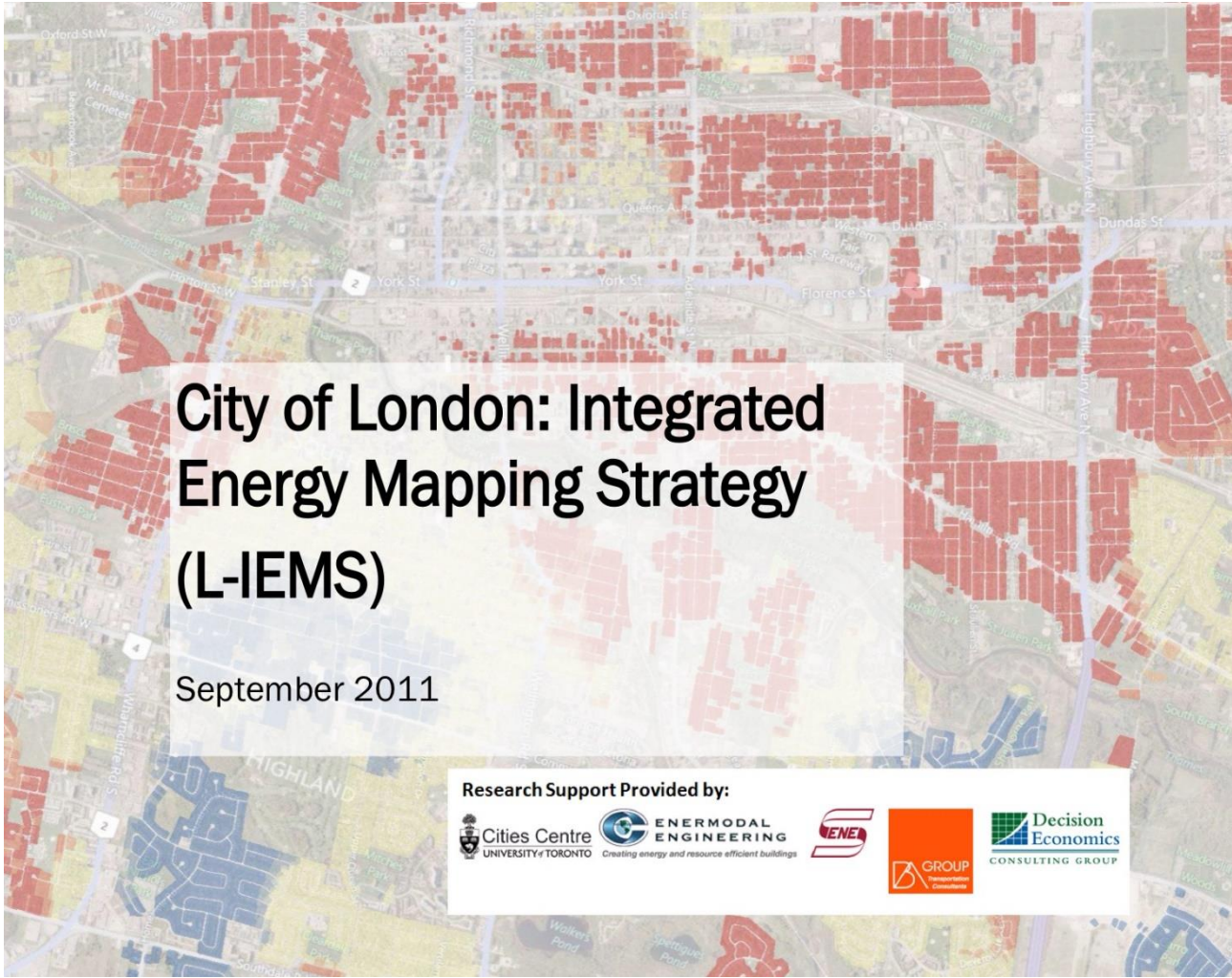
Select Roof Material
asphalt, cedar, concrete, etc 2205

Move & Click

Immagini ©2014 DigitalGlobe Termini e condizioni d'uso

Submitted Not Verified Verified





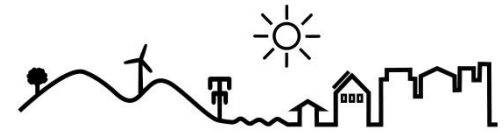
City of London: Integrated Energy Mapping Strategy (L-IEMS)

September 2011

Research Support Provided by:



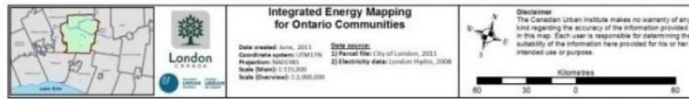
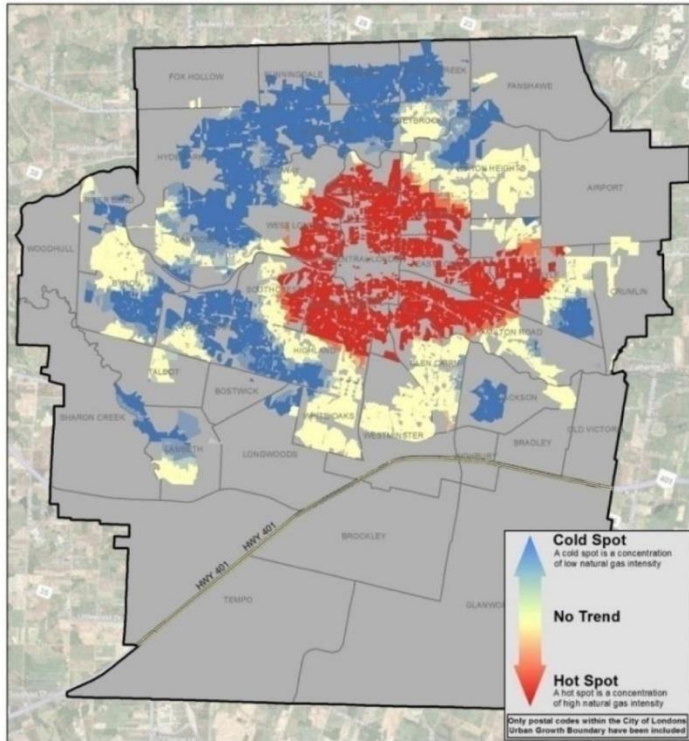
Co-funded by the Intelligent Energy Europe
Programme of the European Union



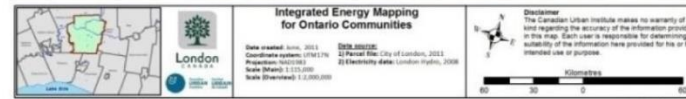
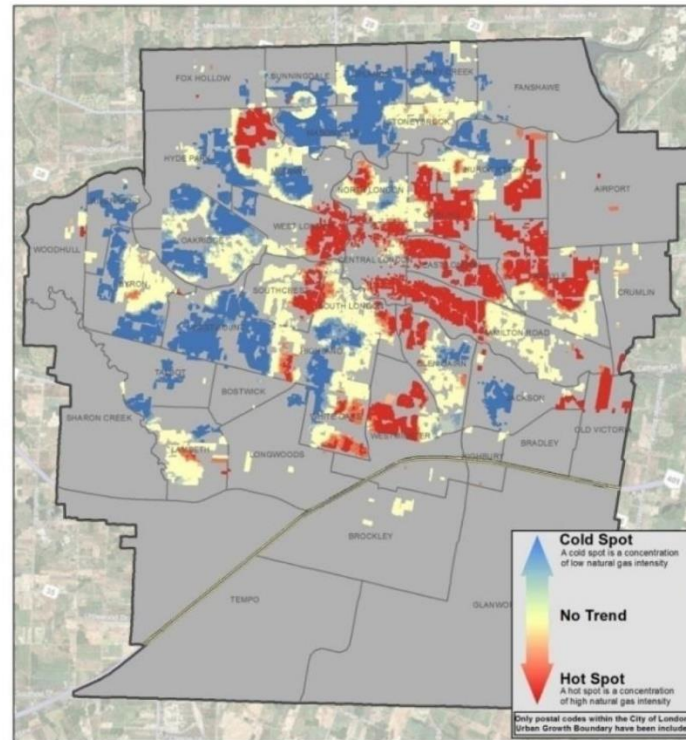
SPECIAL

**SPATIAL PLANNING and ENERGY for
 COMMUNITIES IN ALL LANDSCAPES**

**Residential Gas Hot Spots ($\text{m}^3\text{Gas}/\text{m}^2$)
 City of London**



**Low-Rise Residential Electricity Hot Spot (kWh/m^2)
 City of London**



Renewable District Heating at International Building Exhibition (IBA) Hamburg

„Regenerative“ heating networks

until 2013:
Energy bunker (3)



Integrated Energy Network Wilhelmsburg
Central (4)

until 2015:
Deep geothermal energy Wilhelmsburg (5)



2015



INTERNATIONALE BAUAUSSTELLUNG IBA HAMBURG GMBH



Co-funded by the Intelligent Energy Europe
Programme of the European Union

Renewable District Heating at International Building Exhibition (IBA) Hamburg

The Energy Bunker



source: Denkmalschutzamt Hamburg

INTERNATIONALE BAUAUSSTELLUNG IBA HAMBURG GMBH



Co-funded by the Intelligent Energy Europe
Programme of the European Union

Renewable District Heating at International Building Exhibition (IBA) Hamburg

Concept Development Energy Bunker 2006-2009



- Research Demolition vs. Refurbishment
Ing.-Büro Bartram/ Wahlers
- Energy Concept
Steinbeis Transferzentrum EGS
- Architectural Studies
HHS Architekten
- Storage Concept
Ing.-Büro Achim Lichtenfels
- Use of CHP
Ing.-Büro Sumbi

INTERNATIONALE BAUAUSSTELLUNG IBA HAMBURG GMBH



Co-funded by the Intelligent Energy Europe
Programme of the European Union



Renewable District Heating at International Building Exhibition (IBA) Hamburg

The Energy Bunker

→ Equipment

Wood Chips Boiler: 2000 kWth / 10,5 GWhth/a

Biogas CHP: 500 kWth and 400 kWel /
3,750 GWhth/a and 3 GWhel/a

Low Temperature Oil Peak Load Boiler:
2300 kWth / 3,570 GWhth/a

Solarthermal: 1050 kWth / 0,6 GWhth/a

Photovoltaic (1100 m²): 0,11 GWhel/a

Waste Heat Use: 500 kWth / 4 GWhth/a

Hot Water Storage: 2.000 m³

in total: 22,42 GWhth/a and 3,1 GWhel/a

INTERNATIONALE BAUAUSSTELLUNG IBA HAMBURG GMBH



Co-funded by the Intelligent Energy Europe
Programme of the European Union

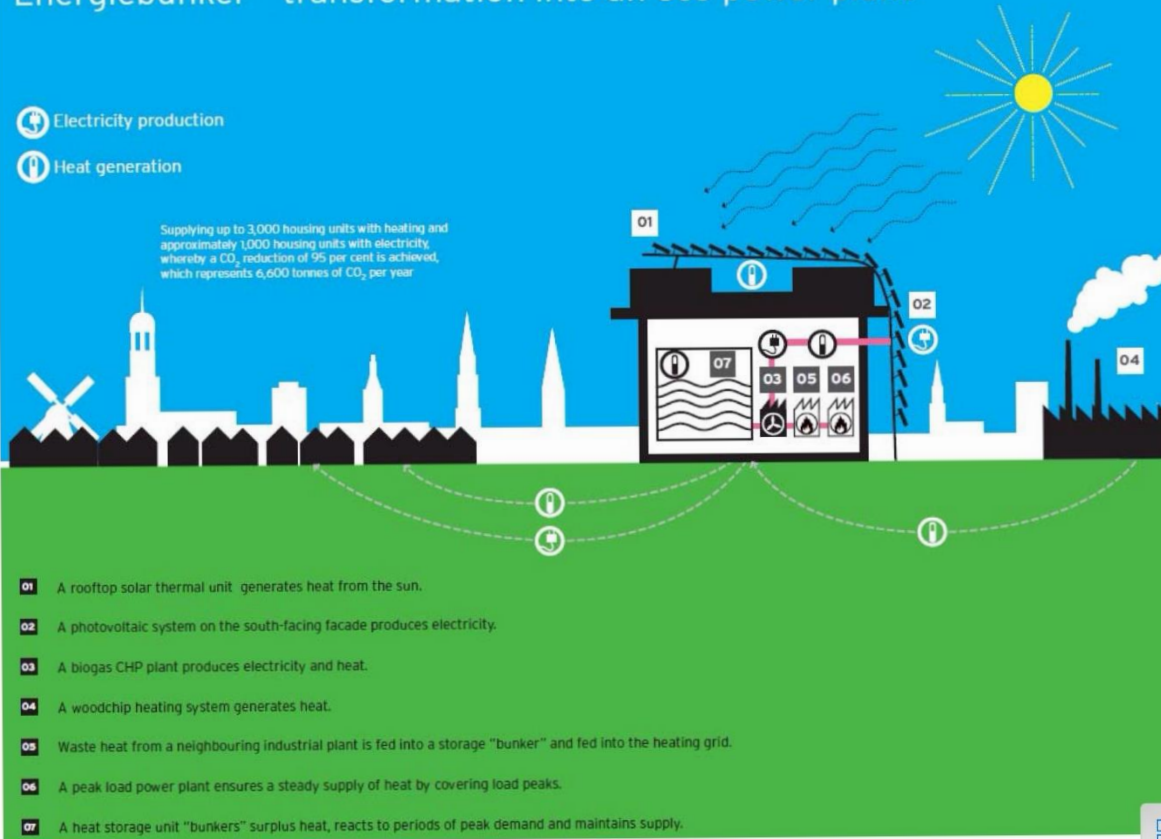
Renewable District Heating at International Building Exhibition (IBA) Hamburg

Energiebunker - transformation into an eco power plant

Electricity production

Heat generation

Supplying up to 3,000 housing units with heating and approximately 1,000 housing units with electricity, whereby a CO₂ reduction of 95 per cent is achieved, which represents 6,600 tonnes of CO₂ per year



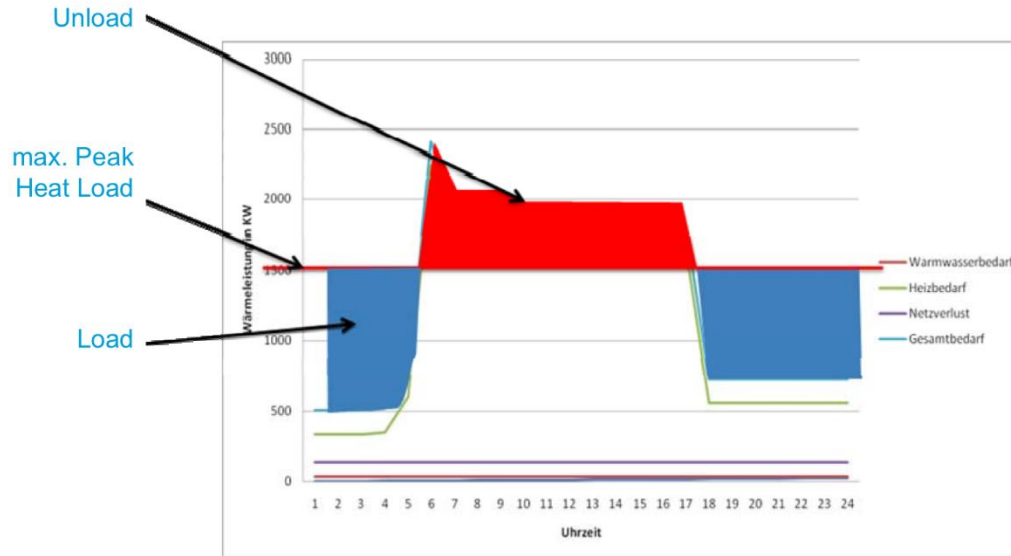
source: IBA Hamburg / urbanista



Co-funded by the Intelligent Energy Europe
Programme of the European Union

Renewable District Heating at International Building Exhibition (IBA) Hamburg

Daily Load Profile using a Buffer Storage



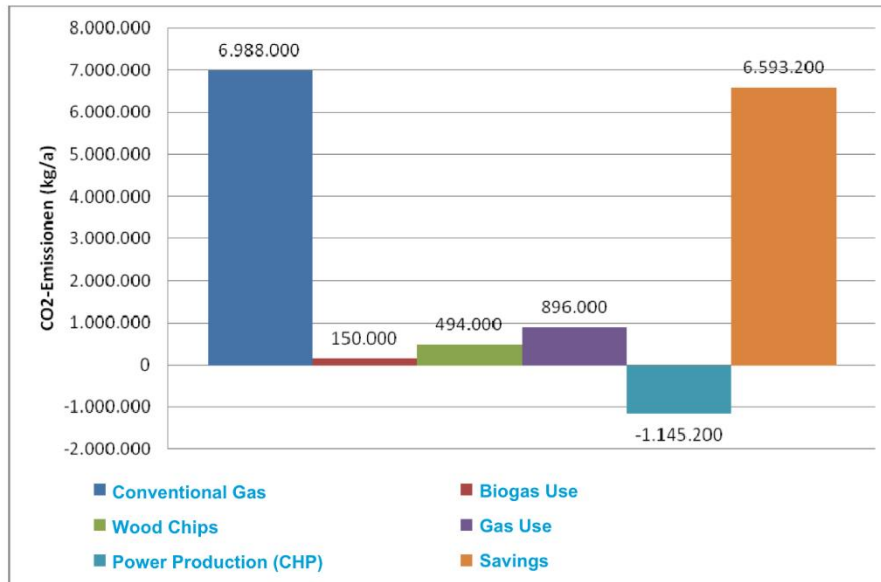
INTERNATIONALE BAUAUSSTELLUNG IBA HAMBURG GMBH



Co-funded by the Intelligent Energy Europe
 Programme of the European Union

Renewable District Heating at International Building Exhibition (IBA) Hamburg

GHG Calculation: 95 % Reduction



INTERNATIONALE BAUAUSSTELLUNG IBA HAMBURG GMBH



Co-funded by the Intelligent Energy Europe
Programme of the European Union

Renewable District Heating at International Building Exhibition (IBA) Hamburg



Heat for
 3.000 Households
 Power for
 1.000 Households



Dieses Vorhaben wird gefördert von der
 Europäischen Union
 Europäischer Fonds für regionale Entwicklung
 Investition in Ihre Zukunft



Co-funded by the Intelligent Energy Europe
 Programme of the European Union







CeNSU

Centro Nazionale Studi Urbanistici



CeNSU

Centro Nazionale Studi Urbanistici