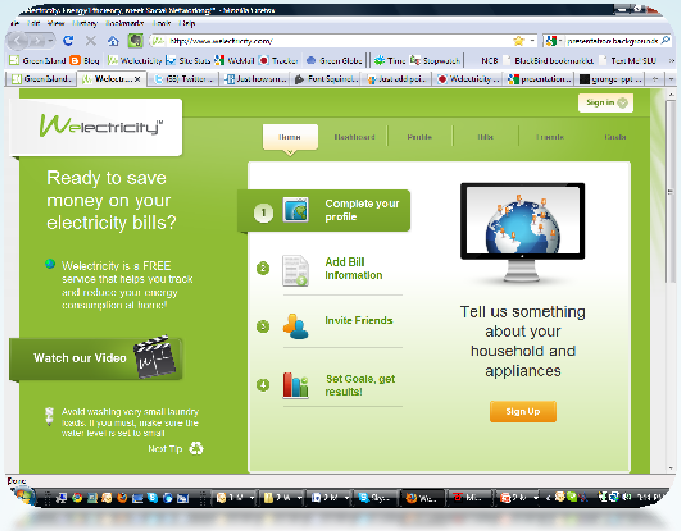
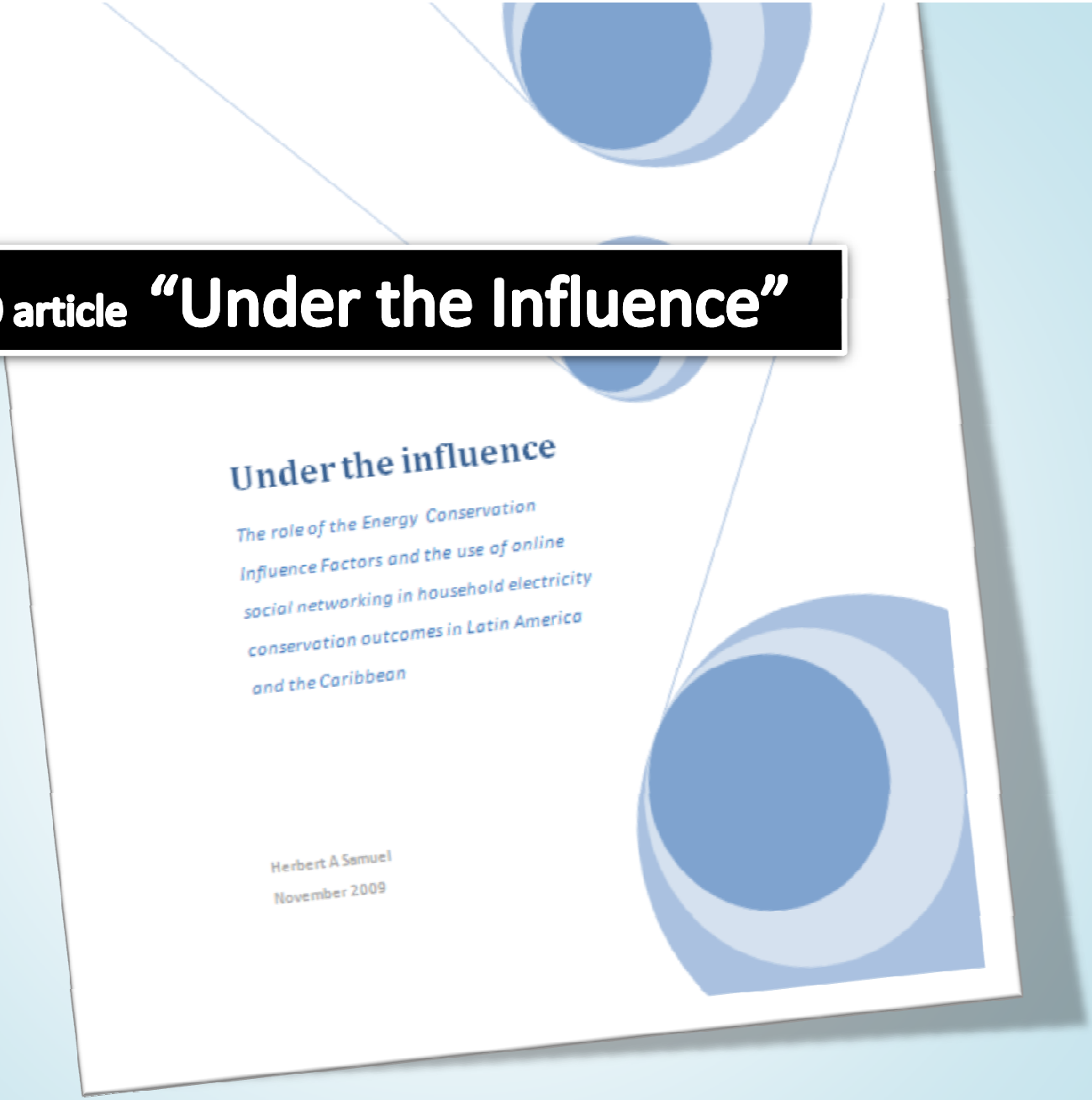


Welectricity

Energy Efficiency, meet Social Networking ™

A New Approach to Household Energy Efficiency

Summary of 2009 article "Under the Influence"



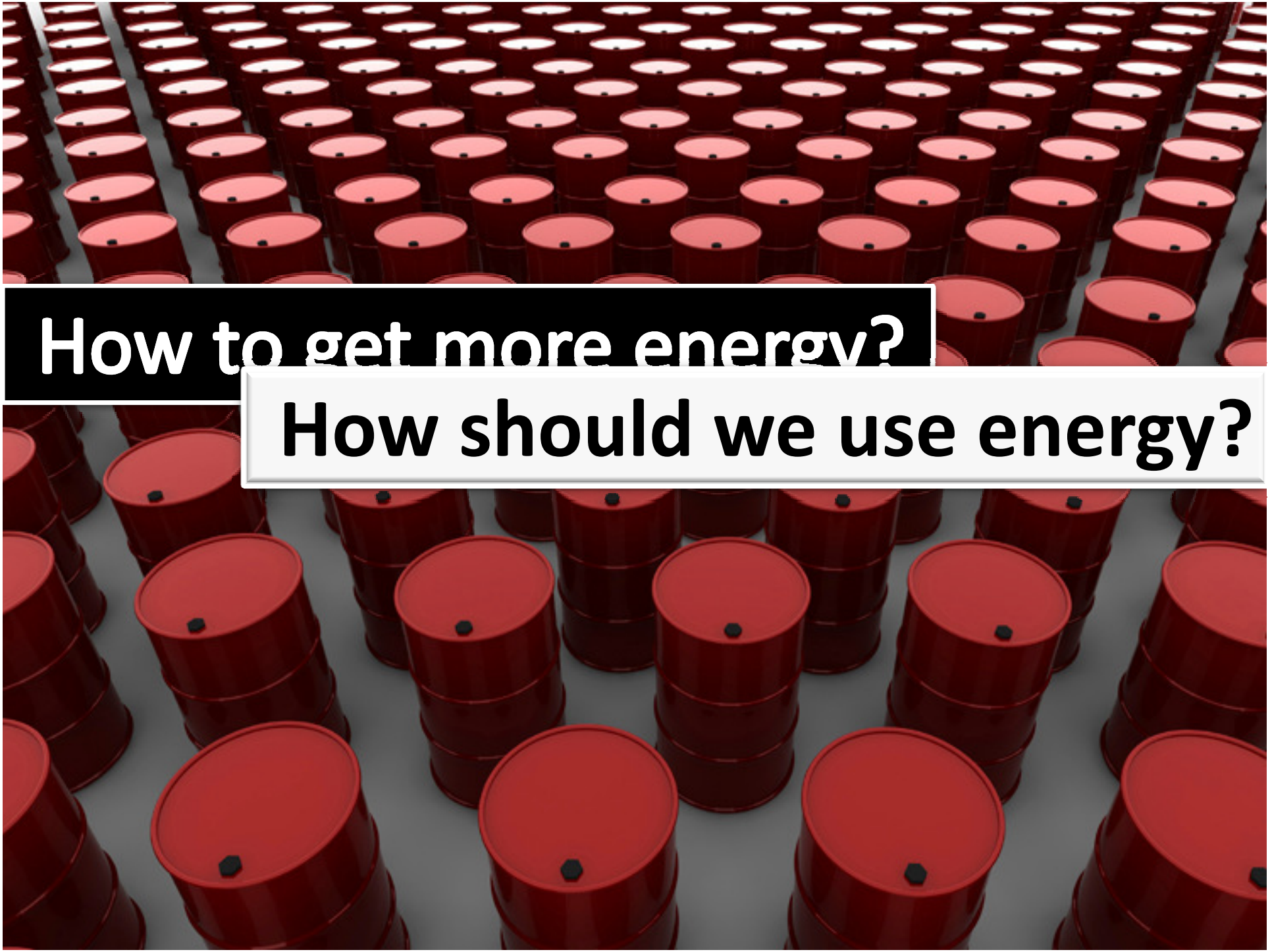
BEHAVIOUR

ENERGY EFFICIENCY

Using less energy to provide the same level of energy service

ENERGY SERVICE

Any service that requires an external provision of energy: cooking food and cooling drink; lighting to allow reading at night; a warm shower on a chilly morning


How to get more energy?
How should we use energy?

ENERGY SERVICE

Energy services can be provided by efficiency – and this elevates energy efficiency to the status of an actual ‘source’ of supply.

ENERGY EFFICIENCY

IDB Sustainable Energy &
Climate Change Initiative

"Latin America and the Caribbean as a whole could reduce energy consumption by 10% over the next decade by investing in widely available technology and equipment."

How to save US$36 billion worth of electricity (without turning off the lights): A survey of Energy Productivity in the Americas. IDB, 2008

ENERGY EFFICIENCY

IDB Sustainable Energy &
Climate Change Initiative

Cost of extending LAC's energy supply to 2018, by way of energy efficiency:

Less than 1/3 the cost of building new generating plant

MR JEVONS RETURNS

But, a complication exists.

MR JEVONS RETURNS

But, a complication exists.

Improvements in the technical energy efficiency of devices (lighting, appliances, automobiles, etc.) often result in little or no decrease in overall energy consumption

EXAMPLE

People who replace incand-escents with CFLs may leave more lights on longer, thereby reducing the efficiency benefit of each new bulb

“It is wholly a confusion of ideas to suppose that the economical use of fuel is equivalent to a diminished consumption. The very contrary is the truth.”

William Stanley Jevons, 1865

THE REBOUND EFFECT

If the cost of a resource is reduced due to increased efficiency, people will consume more of the resource (or the services dependent on the resource) than previously, thereby offsetting (partially or entirely) the effect of the efficiency improvement.

THE REBOUND EFFECT

Generally expressed as a ratio of the 'lost' benefit due to an increase in technical energy efficiency, compared to the expected benefit of the increase.

THE REBOUND EFFECT

EXAMPLE

You buy a new car.
It's 10% more fuel efficient
than your old one,
but you only observe
a 6% drop in fuel use.

There's a 'lost' 4%

The rebound effect is 4/10
= 40%

THE REBOUND EFFECT

Relevance?

It’s a universal & significant behavioral response

THE REBOUND EFFECT

"The evidence does not suggest that improvements in energy efficiency routinely lead to economy-wide increases in energy consumption, as some commentators have suggested.

At the same time the evidence does not suggest that economy-wide rebound effects are small (e.g. <10%) as many analysts and policy-makers assume. Rebound effects therefore need to be taken seriously in policy appraisal."

UK Energy Research Centre. (2007). *The Rebound Effect: an assessment of the evidence for economy-wide energy savings from improved energy efficiency*

THE REBOUND EFFECT

A 2009 study by Barker et al concludes that

"the total rebound effect arising from the IEA WEO 2006 (IEA 2006) energy-efficiency policies for final energy users over 2013–2030 is around 50% by 2030, averaged across sectors of the economy."

BEHAVIOR

In other words, half of the benefit of technical energy efficiency increases will be lost by 2030, *due to the behaviour of consumers*

BEHAVIOUR

"Little emphasis has been placed on behavioural approaches to energy conservation, yet many researchers, in both the physical and the social sciences, have suggested that neglecting the energy consumer is tantamount to ignoring a potentially enormous source of energy savings."

Shippee (1980)

BEHAVIOUR

"the success of technological innovations designed to enhance energy conservation depends to a great extent on the consumer's behavioural responses".

Shippee (1980)

BEHAVIOUR

Ross and Williams (1976) believe that

"behavioural changes could result in conservation of up to 50 percent of resources consumed in the residential sector."

BEHAVIOUR

Question:
What are the specific behavioural factors that will *encourage* energy conservation outcomes?


Provision of
Feedback
Availability of
Information
Opportunities for
Goal-setting
Opportunities for
Social Proof

INFORMATION

Householders wishing to reduce their energy bills need to know:

- What amounts of energy they are using
- How they are using it and
- What actions they can take to use less

INFORMATION

Monthly electricity bills provide information on consumption and cost

Many bills include standard energy saving ‘tips’ printed somewhere on them

Some bills have a table showing the last few months of consumption history

Some bills include a chart of a few months consumption history

INFORMATION

"Information on its own has a poor track record in achieving energy conservation. While people may appreciate the message, few are likely to be spurred into action"

Darby (2006)

FEEDBACK

"Clear feedback is a necessary element in learning how to control fuel use more effectively over a long period of time…

and … is needed as a basis for sustained demand reduction."

Darby (2006)

Feedback *"improves the effectiveness of … information and advice in achieving … control of energy use."*

GOAL SETTING

Feedback is shown to be interactively related to the ability of the consumer to set meaningful goals.

Eg: in one particular experiment, people who set difficult goals AND were given feedback, achieved better results than people who set easy goals but who were not given feedback

SOCIAL PROOF

In 2004, psychologist Dr Robert Cialdini performed a now-famous experiment.
His team left different messages on doorknobs in a middle-class San Diego neighbourhood, urging the residents to conserve energy:

SOCIAL PROOF

In 2004, psychologist Dr Robert Cialdini performed a now-famous experiment.
His team left different messages on doorknobs in a middle-class San Diego neighbourhood, urging the residents to conserve energy:

For the sake of the environment

SOCIAL PROOF

In 2004, psychologist Dr Robert Cialdini performed a now-famous experiment.
His team left different messages on doorknobs in a middle-class San Diego neighbourhood, urging the residents to conserve energy:

For the sake of the environment
To save the earth for future generations

SOCIAL PROOF

In 2004, psychologist Dr Robert Cialdini performed a now-famous experiment.
His team left different messages on doorknobs in a middle-class San Diego neighbourhood, urging the residents to conserve energy:

For the sake of the environment
To save the earth for future generations
To save money

SOCIAL PROOF

In 2004, psychologist Dr Robert Cialdini performed a now-famous experiment.
His team left different messages on doorknobs in a middle-class San Diego neighbourhood, urging the residents to conserve energy:

For the sake of the environment
To save the earth for future generations
To save money
Because your neighbours are already doing so

SOCIAL PROOF

What was the effective message?

YOUR NEIGHBOURS ARE ALREADY SAVING!

For the sake of the environment

To save the earth for future generations

To save money

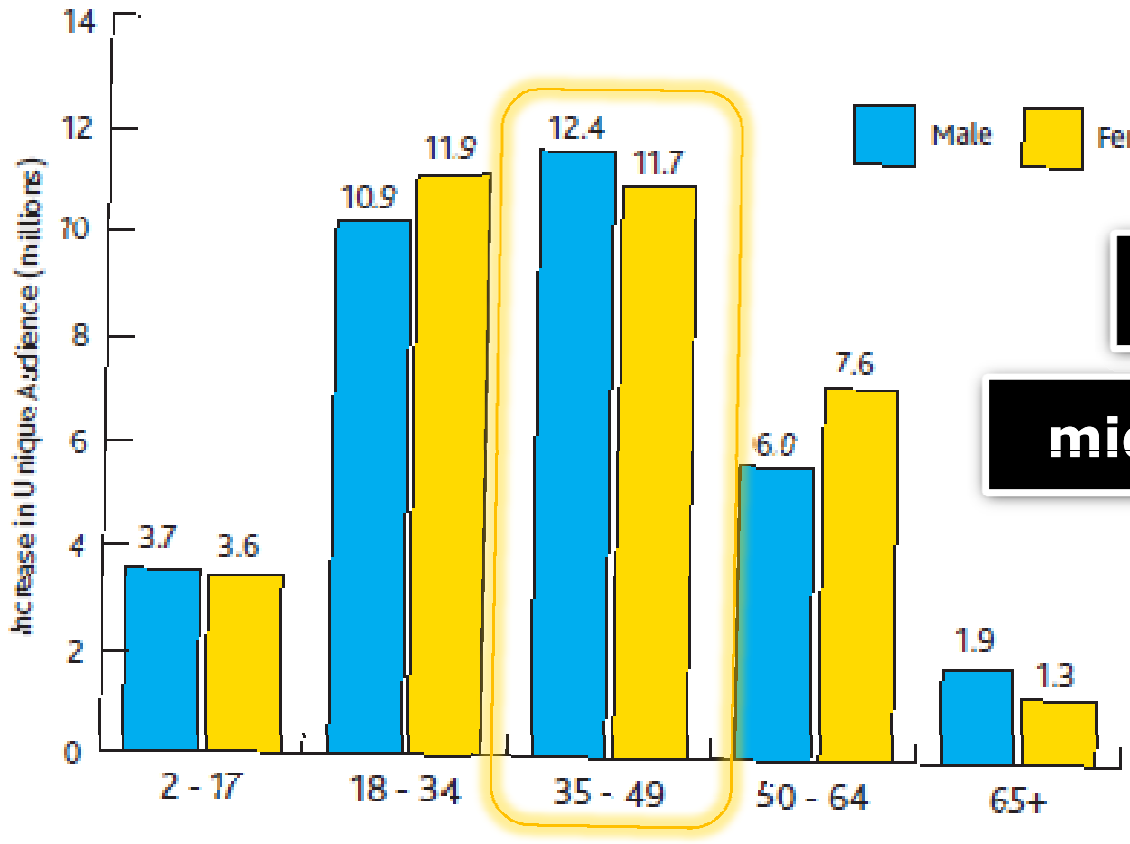
Because your neighbours are already doing so


Provision of
Feedback
Availability of
Information
Opportunities for
Goal-setting
Opportunities for
Social Proof

SOCIAL NETWORKING

EXAMPLE

Facebook's greatest growth in global[1] audience numbers has come from people aged 35-49



Becoming middle-aged...

Source: Nielsen Online, Global Index, December 2007 – December 2008. E.g. Between Dec 07 and Dec 08 there was a 3.7 million global increase in the number of 2-17 year old males visiting Facebook

[1] 'Global' refers to AU, BR, CH, DE, ES, FR, IT, UK & USA only

SOCIAL NETWORKING

The value proposition of the online social network: an aggregator of the behavioural factors into one easily-accessible platform, in a format that is becoming increasingly popular.

SOCIAL NETWORKING

Using a specifically-designed social network, households can receive information and feedback, can compare their usage to that of similar others and can set and monitor energy reduction goals.

SOCIAL NETWORKING

Moreover, via a social network, which is an ever-evolving platform, information and feedback can be presented to users in a variety of engaging and vivid ways; goal-setting can be interactive with other users and social proof can take on a competitive bent that may reinforce its effect.

Energy Efficiency, meet Social Networking ™

welectricity.com

Energy Efficiency, meet Social Networking ™

welectricity.com

Energy Innovation Contest

Up to $200,000 (USD) per project

GVEP International, IDB, the Korean Government and GTZ are looking for unconventional solutions to the energy problems affecting Latin America and the Caribbean. We will award funding for implementing innovative ideas that improve energy efficiency or increase access to renewable energy, especially in low-income communities.

Deadline for submission of applications is May 15, 2009.

Visit www.iadb.org/ideas

GVEP international IDB gtz

THE BUSINESS CASE

Utility has 2 options to provide Energy Service

The utility can supply
the marginal kWh

THE BUSINESS CASE

Utility has 2 options to provide Energy Service	
The utility can supply the marginal kWh	Help the HH avoid consuming the marginal kWh

THE BUSINESS CASE

Utility has 2 options to provide Energy Service	
The utility can supply the marginal kWh	Help the HH avoid consuming the marginal kWh
Incurs a marginal cost of supply	

THE BUSINESS CASE

Utility has 2 options to provide Energy Service	
The utility can supply the marginal kWh	Help the HH avoid consuming the marginal kWh
Incurs a marginal cost of supply	Avoids the marginal cost of supply

THE BUSINESS CASE

Utility has 2 options to provide Energy Service	
The utility can supply the marginal kWh	Help the HH avoid consuming the marginal kWh
Incurs a marginal cost of supply	Avoids the marginal cost of supply
Sells the marginal kWh at a profit (P_m)	

THE BUSINESS CASE

Utility has 2 options to provide Energy Service	
The utility can supply the marginal kWh	Help the HH avoid consuming the marginal kWh
Incurs a marginal cost of supply	Avoids the marginal cost of supply
Sells the marginal kWh at a profit (P_m)	Profits by the amount of the avoided cost (P_n)

THE BUSINESS CASE

Utility has 2 options to provide Energy Service	
The utility can supply the marginal kWh	Help the HH avoid consuming the marginal kWh
Incurs a marginal cost of supply	Avoids the marginal cost of supply
Sells the marginal kWh at a profit (P_m)	Profits by the amount of the avoided cost (P_n)

P_m in many cases < P_n

THE BUSINESS CASE

License Welectricity to utilities

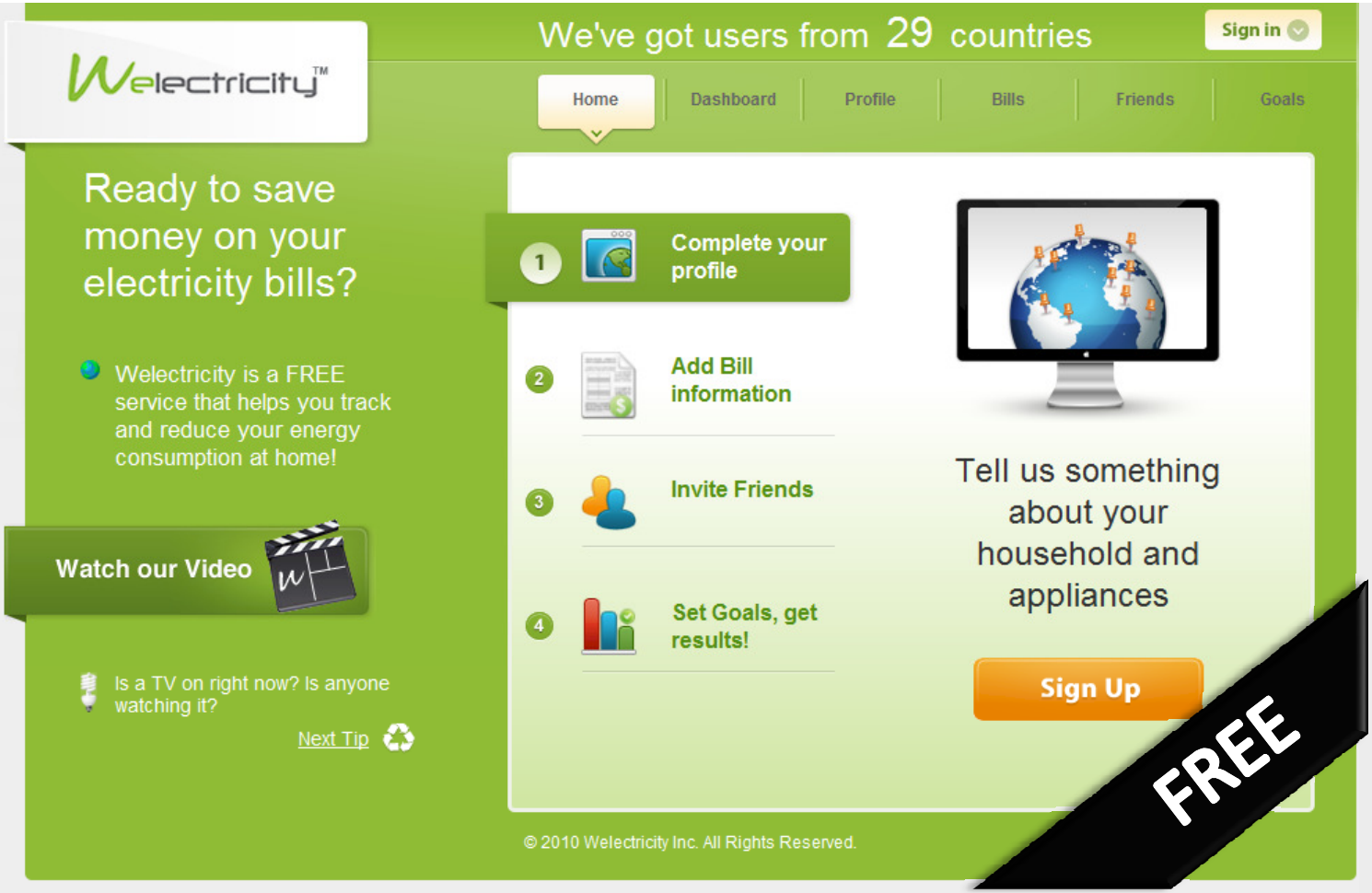
Utilities will roll a customised version of Welectricity out to their customers with their own logo, branding, customer service messages, news & other information, etc.

THE BUSINESS CASE

More Energy Service
provided by conservation

- Customers Benefit
- Utilities Benefit
- Countries Benefit

(Less fuel used &
Fewer GHG emitted)



Welectricity is in 29 countries

Anguilla Antigua and Barbuda Australia Barbados Canada Colombia Djibouti France Ghana Grenada Hong Kong India Indonesia Jamaica Japan Kenya Martinique Netherlands New Zealand Nicaragua Norway Portugal Saint Kitts and Nevis Saint Lucia Saint Vincent and the Grenadines Sweden Trinidad and Tobago United Kingdom United States

Thank you!

References

Abrahamse, Wokje; Steg, Linda; Vlek, Charles and Rothengatter, Talib. (2005). *A review of intervention studies aimed at household energy conservation.* Journal of Environmental Psychology

Barker, Terry; Dagoumas, Athanasios & Rubin, Jonathan. (2009). *The macroeconomic rebound effect and the world economy*

Becker, Lawrence J. (1978). *Joint effect of feedback and goal setting on performance: A field study of residential energy conservation.* Journal of Applied Psychology

Darby, Sarah (2006). *The effectiveness of feedback on energy consumption: A review for DEFRA of the literature on metering, billing and direct displays*

The Economist, September 4th 2008. *The Frugal Cornucopian*

Herring, Horace. (2008). *Definition and Implications of the Rebound Effect.*

Encyclopedia of Earth, http://www.eoearth.org/article/Rebound_effect#

Inter-American Development Bank. (2008). *How to save US$36 billion worth of electricity (without turning off the lights): A survey of Energy Productivity in the Americas*

The New York Times, January 30th 2009. *Utilities Turn Their Customers Green, With Envy*

Schultz, P. Wesley. (2008). *The Constructive, Destructive, and Reconstructive Power of Social Norms*. Presented at the 2008 Behavior, Energy, and Climate Change (BECC) conference, Sacramento, CA.

Shippee, Glen. (1980). *Energy Consumption and Conservation Psychology: A Review and Conceptual Analysis.* Department of Psychology, University of Missouri – Kansas City

Stern, Nicholas; Dietz, Simon; Hope, Chris & Zenghelis, Dimitri. (2007).

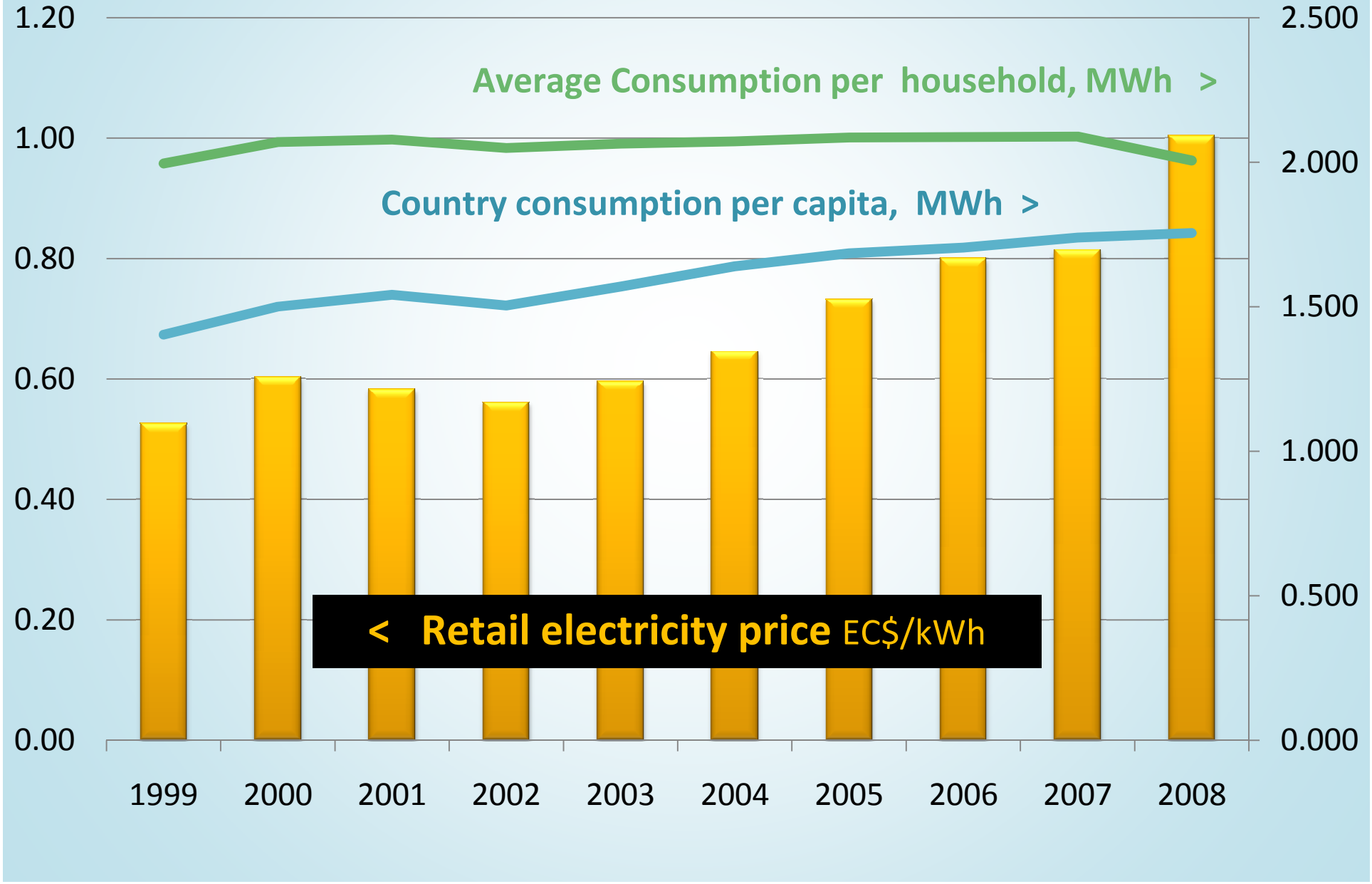
Reflections on The Stern Review (1) A robust case for strong action

To reduce the risks of climate change. World Economics, Vol. 8 No. 1, January–March 2007, Appendix.

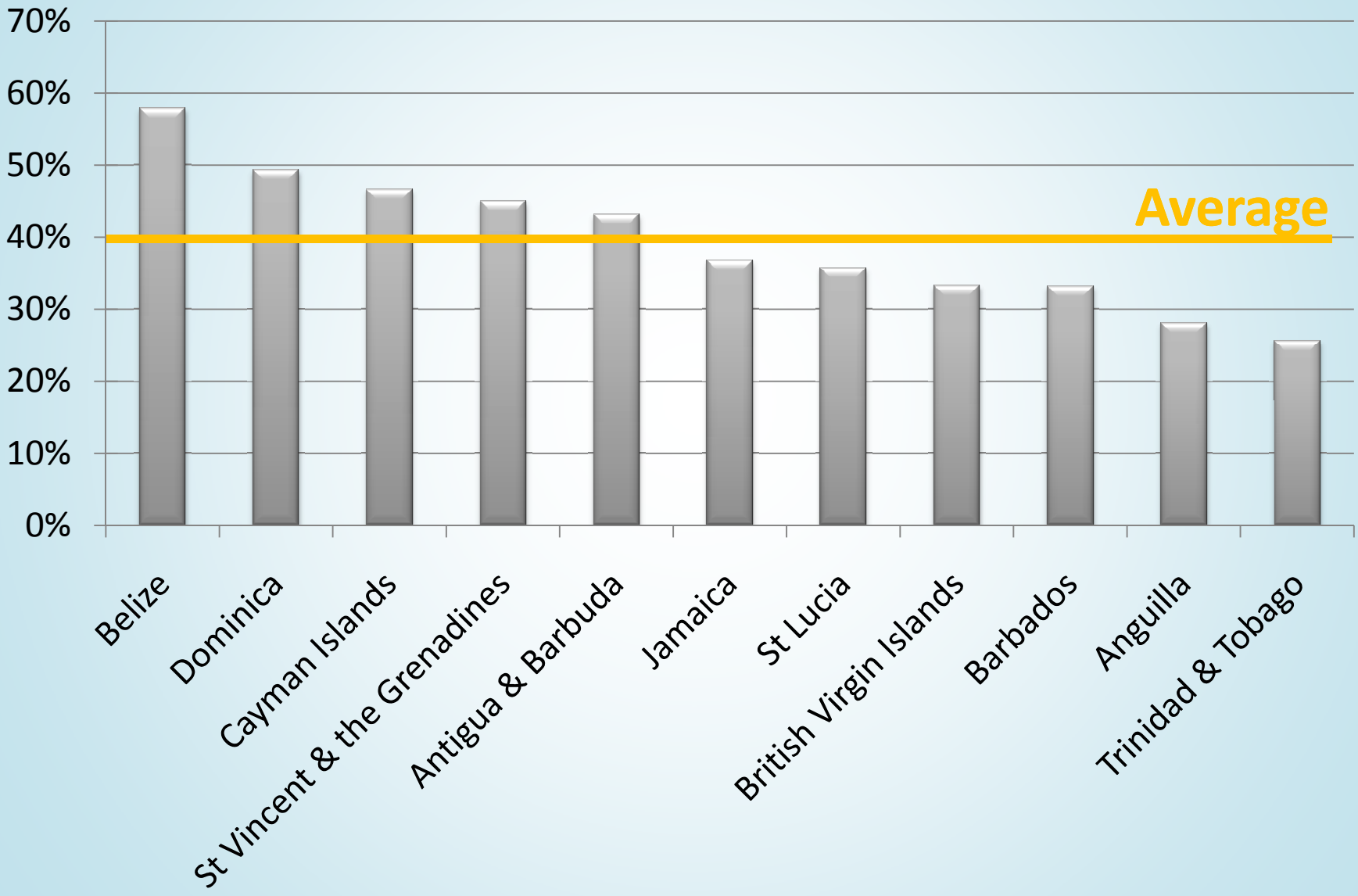
UK Energy Research Centre. (2007). *The Rebound Effect: an assessment of the evidence for economy-wide energy savings from improved energy efficiency*

World Health Organization. http://www.who.int/dietphysicalactivity/publications/facts/obesity/en/

Saint Lucia


1.20
1.00
0.80
0.60
0.40
0.20
0.00
2.500
2.000
1.500
1.000
0.500
0.000
Average Consumption per household, MWh >
Country consumption per capita, MWh >
< Retail electricity price EC$/kWh
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008

HH SECTOR CONSUMPTION % OF TOTAL SALES



2005 Data. Source: CARILEC