



# Energy from Glass



# The Situation





**70%**

of the world's population will live in an urban area by 2050



**80%**

of the world's carbon emissions are produced by cities



**40%**

of the world's energy is consumed by buildings

# The challenge

## Generate electricity in the heart of cities

- where **people live** and **consume**
- where **space** is **scarce**
- where **esthetics** are **valued**
- where **environmental impact** must be **minimal**





# Our solution

Generate electricity from almost **every glass surface** you can imagine...

- facades
- windows
- balconies
- anti-noise barriers
- fences
- verandas
- bus shelters
- etc...



# Our technology



- **dye-sensitized cell** technology (DSC)
- leading-edge **nanotechnology** invented by **Prof. Grätzel** from the EPFL
- representing the **3rd generation** photovoltaics

1st generation:                      CSi

2nd generation:                    thin-film CSi

3rd generation:                    DSC

# Think of it as artificial photosynthesis...



sun



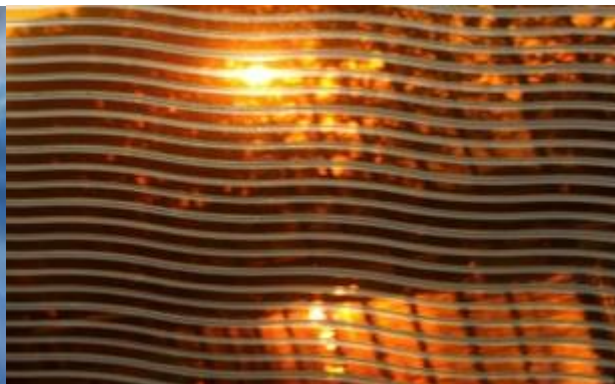
leaves



energy to grow



sun



*glass2energy* modules



electricity

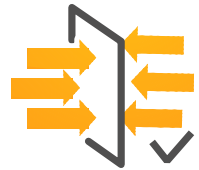
# *glass2energy* modules are 10x different...



diffuse light



every orientation



from both sides



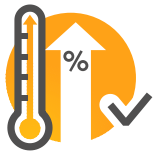
transparent



efficient in interior



colored



efficiency improves  
with temperatures



100% glass  
structure



low sensitivity to  
shadows

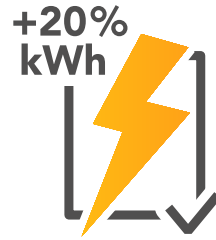


easy to recycle  
no rare earth  
no toxic material





# 3 key benefits...



## 1. High energy generation

20-30% more kWh/Wp **harvest**  
(v. C-Si PV of same capacity,  
at same angle&orientation)



## 2. Multiple applications

transparency, colors, designs  
and totally new uses



## 3. Low environmental impact

much better profile than  
existing PVs

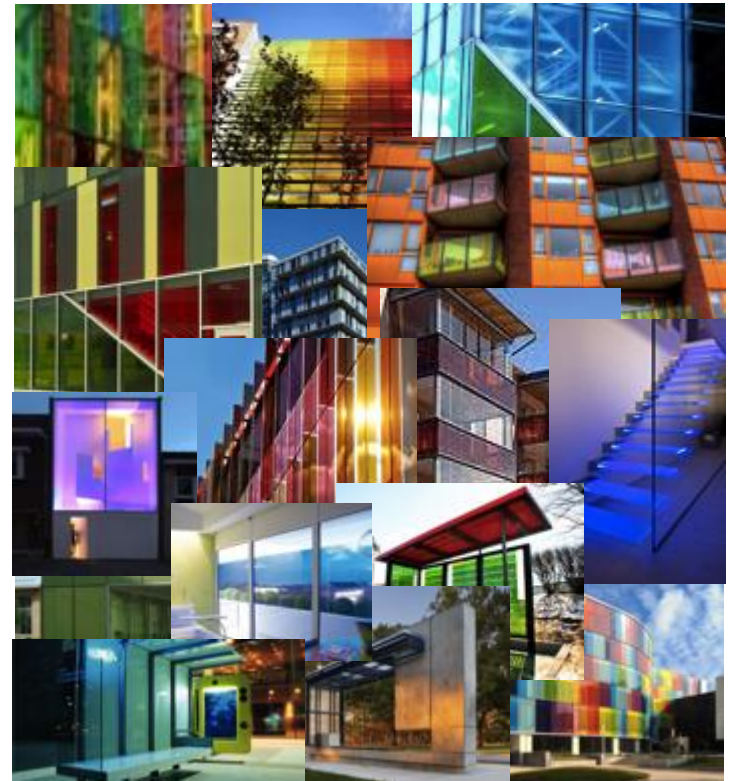
# Different & complementary uses...



focus on **electricity generation only**,  
mainly **on roofs** and **solar farms**



**colors, transparency, design**  
and **electricity generation** on  
**vast range of applications**



# Huge market opportunity...



- 1.**  
building market  
(green/zero emission  
buildings)
- 2.**  
eMobility/green  
mobility
- 3.**  
nomadic energy





# 780%

growth for green buildings (energy efficient/zero emissions) between 2010 and 2020 giving...

# 2.1Bio m2

green building facades and windows, 5.3Bio m2 floor space per year

# 3.1Trio CHF

market at an average cost of CHF1'500.-/m2



# 100 Mio

electric bicycles circulating in China

# 20 Mio

electric bicycles expected in Europe within 5 years

# No

public charging infrastructure

# 7 Bio

mobile devices in the world by end 2013<sup>1)</sup>

# 3.2 Bio

passengers in top 100 airports in the world in 2011<sup>2)</sup>

# No

dedicated charging infrastructure



3. nomadic energy



# Our products...



**1.**

building integrated  
modules



**2.**

off-grid shelters



**3.**

charging stations for  
mobile devices



# 1. Building integrated modules...



balcony / guard-rails



# 1. Building integrated modules...



facades office/commercial

# 1. Building integrated modules...



facades industrial

# 1. Building integrated modules...



facades logos

# 1. Building integrated modules...



vegetalized roofs

# 1. Building integrated modules...



anti-noise barriers

# Our products...



**1.**

building integrated  
modules



**2.**

off-grid shelters



**3.**

charging stations for  
mobile devices



## 2. off-grid shelters



eBikes & pedelecs

## 2. off-grid shelters



public transport



## 2. off-grid shelters



public transport

# Our products...



**1.**

building integrated  
modules



**2.**

off-grid shelters



**3.**

charging stations for  
mobile devices



### 3. Charging stations mobile devices



indoor

### 3. Charging stations mobile devices



outdoor

# 3. Charging stations mobile devices



prestige

# Thank you



CAPITAL RISQUE FRIBOURG  
RISIKOKAPITAL FREIBURG

