

# NBS examples and analysis



UNIVERSITÉ  
DE LORRAINE





# Table of contents

- ▣ VertECO
- ▣ Natura bee
- ▣ Myfood
- ▣ Urban Canopee
- ▣ The BIQ house
- ▣ Bocage Urbain

1.

VertECO

A green way to clean our water



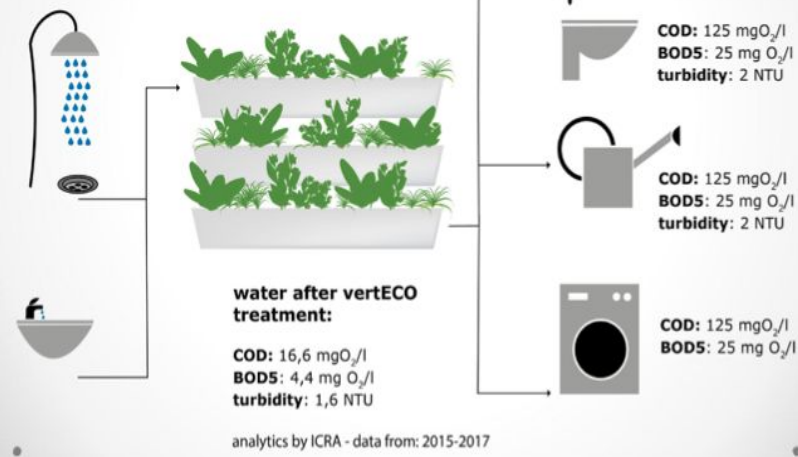
## The concept

An indoor vertical constructed plant based wetland allowing to treat grey waters :

- Reducing drinking water consumption
- Using plants/microorganisms symbiosis
- With an aesthetic value
- Improving indoor environnement

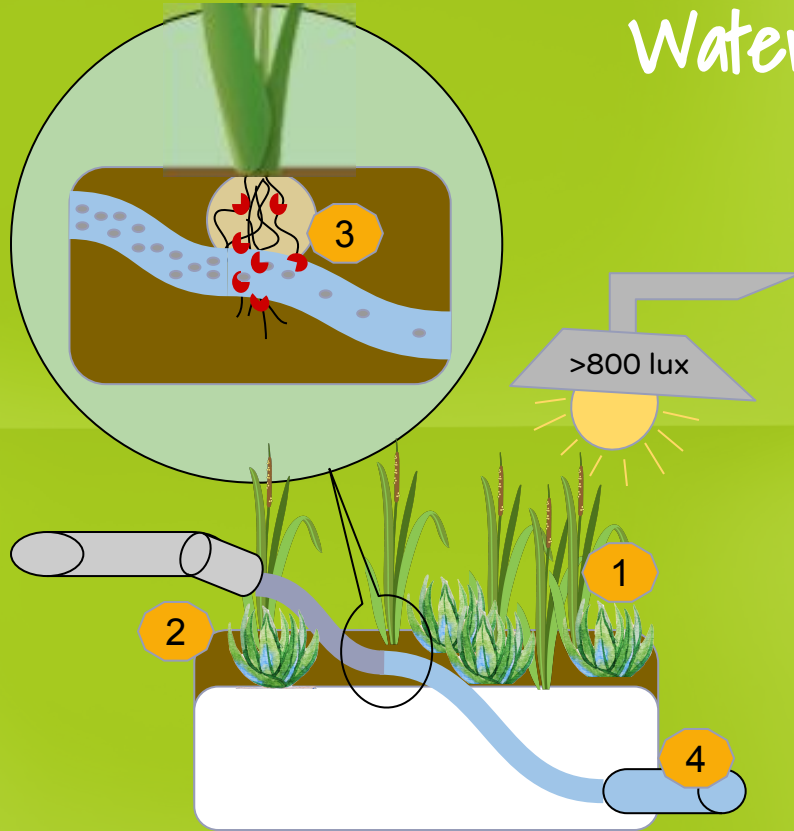
### greywater:

**COD:** 208,5 mgO<sub>2</sub>/l  
**BOD5:** 96,2 mg O<sub>2</sub>/l  
**turbidity:** 67,5 NTU



COD = dissolved organic carbon  
BOD5 = biochemical oxygen demand for 5 days  
Turbidity = cloudiness of a fluid caused by particles

# Water treatment by plants = Phytodepuration



- 1 Growth of **specific plants** : marsh plants, graminoids, tropical or subtropicals
- 2 **Polluted** water entrance : organic matter, NPK, micropollutants.
- 3 Treatment of the water by the **microorganisms** that live in the **rhizosphere**.  
Degradation of the suspended matter.
- 4 Exit of the **cleaned** water

## Principal issues :

- Need a gardener to take care of the plants
- Big & heavy structure => 4 m & 1 500 kg/m<sup>3</sup>-water/day
- Don't treat all types of pollutants (Heavy metals)
- Closed system



matière\_première.png

## How to Improve ?

- Use human care independant plants
- Use less heavy & spacious substratum or hydroponics system
- Use hyperaccumulators
- Bacteria inoculation



2.

# Natura bee

Biodiversity into cities





# The concept: Bringing more bees into cities

## Urban Beekeeping

Since 2013 implement hives  
in firms and communities



- Unite people around a commun and responsible project
- Bring out work areas
- Raise awareness towards biodiversity issues
- Harvest honey on site

## Team building and environmental friendly project



Workers  
well  
being

Biodiversity



Installation



Maintenance

8

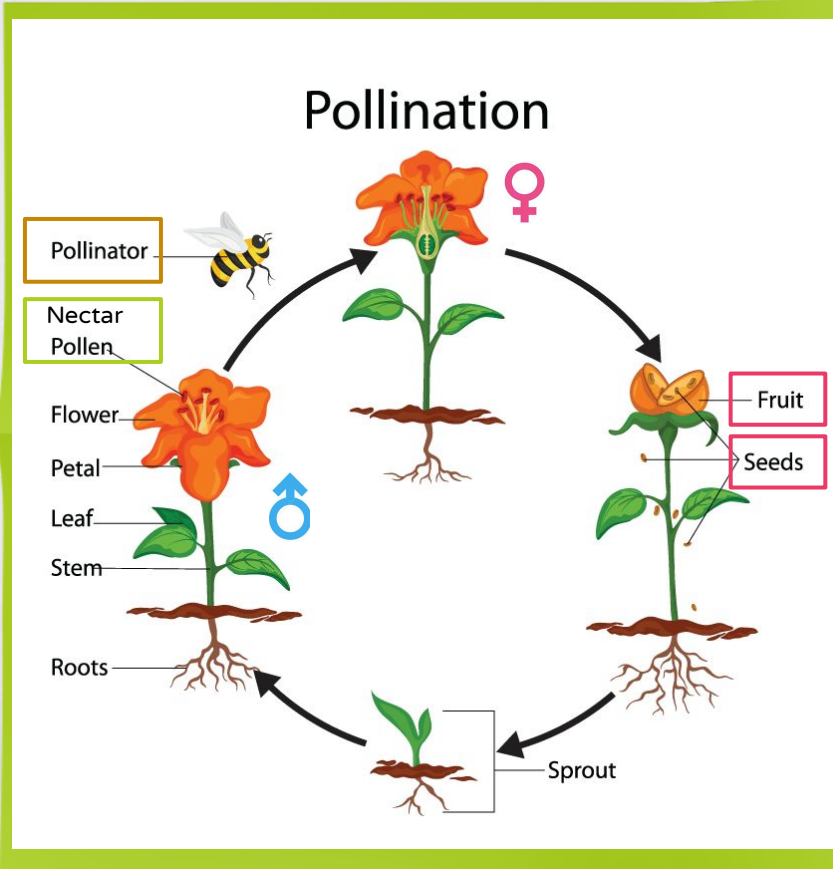


organic  
product

Harvest

[naturabee.com](http://naturabee.com)





## Bees and Pollination

No bees - No seeds

- 75% of main subsistence crops are pollinated by animals
- 85% of flowering plants are biotically pollinated
- 9.5% of the value of world agricultural production



## Issues

- 15% of pollination by the honey bee - domestic
- 80% of pollination by wild insects
- Competition for food resources with wild bees
- Allergy



## How to Improve ?

- Better control on size and area of honey bees' hives
- Encourage food resources and habitat for wild bees
- Insect hotels
- Increase awareness

“If wild pollinator declines continue, we run the risk of losing a substantial proportion of the world's flora.”

3.

Myfood

Cultivating in town



## The concept: Connected vertical hydroponic agriculture



Innovative technology: **the aerospring**. Allowing anyone to grow vegetables without any soil and limiting the consumption of drinking water and inputs.

- **1:** Using **organic manure** directly in the water to feed the plants
- **2:** **Water circulation** from the basin to the culture tower thanks to a pump
- **3:** **Closed system** continuous irrigation of the plants
- **4:** Roots grow in a **neutral matrix**



Space efficiency



Water efficiency



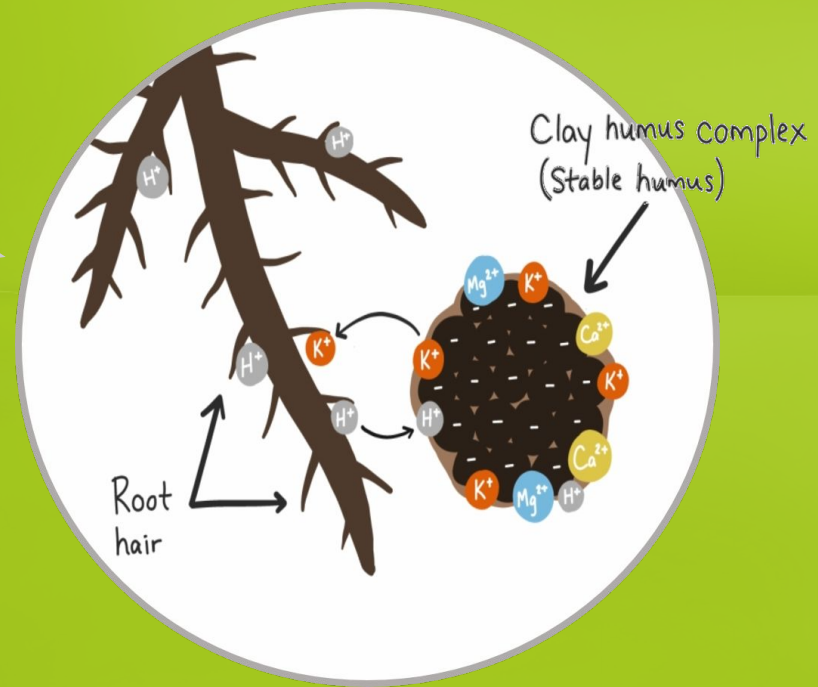
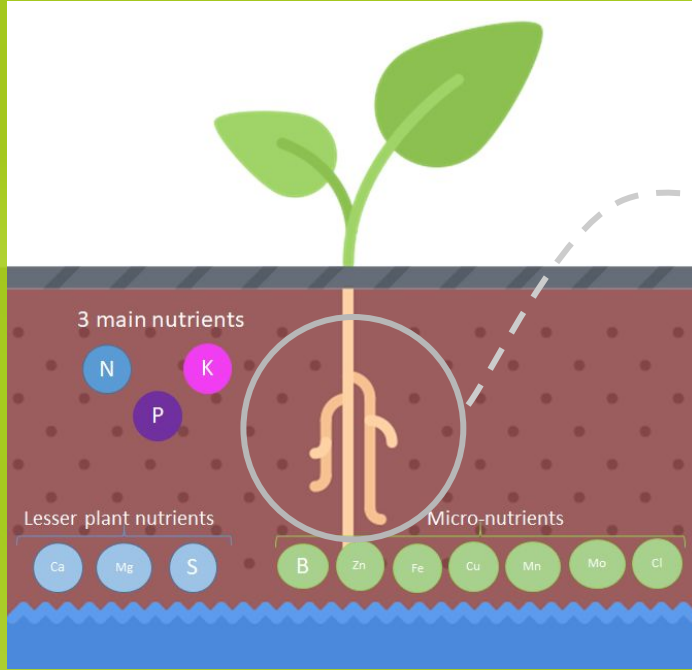
Electricity efficiency

**Optimized management:**

All installation are equipped with connected equipment to follow information about pH, temperature.



# Nutritional needs of plants



## Issues

- Difficult management of the nutritional solution
- Nutrient deficiency and accumulation of sulphate
- Growth of algae and quick spreading of pests
- Even if it is in closed circuit, needs of intrants

## How to Improve ?

- Recycling the solution thanks to a closed circuit
- Implement antagonistic micro-organism

4.

# urbanCanopee

Deploying plant canopies in the city



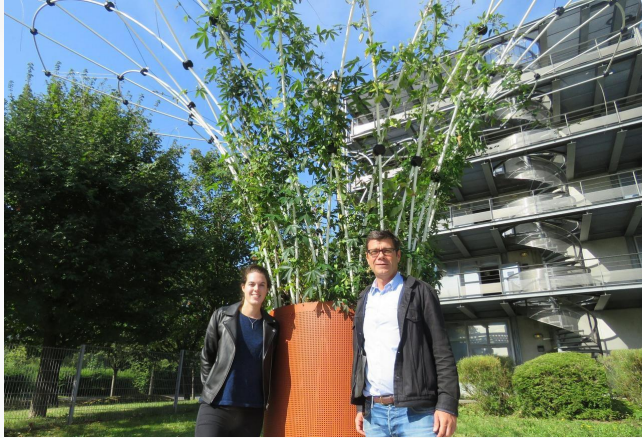
## The concept



### The structure :

- Lightweight, adaptable and flexible
- Made of composite materials
- Modular and reversible
- Possible to connect several structures together to increase the area of shaded surface

## The concept



### The plants :

- Grafted on the structure
- Climbing plants which provide freshness from the shade
- Limit greenhouse gas emissions
- Reduce the risk of flooding
- 9 climbing plants (Akebia, Clematis, Hydrangea, Jasmine, Bignone, Hops, Rosebush, Passiflore, Virginia Creeper)

## The concept

### The Sensopee System :

- Pot containing a specific substrate and a water storage, combined with sensors. Allows to develop and implement an irrigation algorithm with distance monitoring.
- Thanks to the data collected, maintenance is reduced and the system transmits data back to a central point : temperature, hygrometry, diverse particles, biodiversity.
- Allows the canopy to be completely independent for its water and electricity needs.

## Issues :

- Big structure => big amount of water
- 9 different climbing plants not all from France
- Composite structure with plastic

## How to Improve ?

- Use more sustainable materials or recycled plastic
- Use local plants

5.

## The BIQ House

Produce energy with algae

# The concept : produce renewable energy



Buildup.eu

Hamburg, 2013  
SolarLeaf system

Project cost: 5 M €

129 bioreactors measuring 2.5m x 0.7m

15 residential units

Provides around  $\frac{1}{3}$  of the total  
heat demand of the BIQ house

200 m<sup>2</sup> of facade covered by  
SolarLeaf panels

30 KWh/m<sup>2</sup>.year

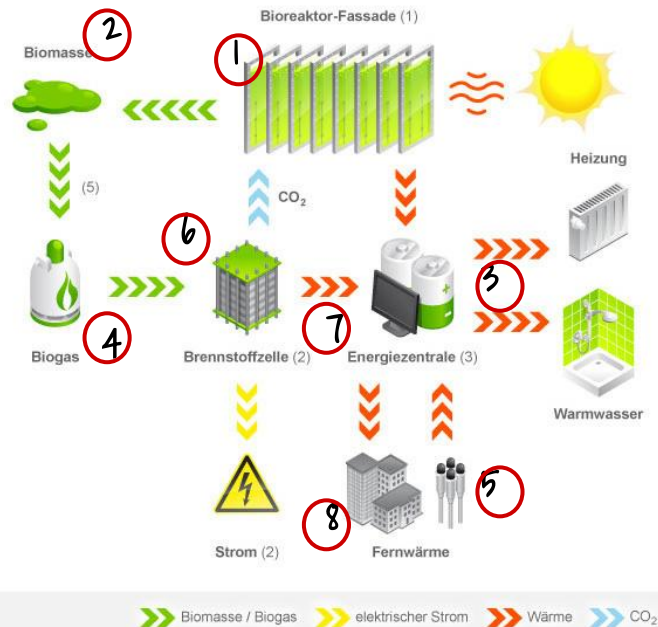


urbanews.fr



# The concept

1. Bioreactor façade
2. Algae Biomass
3. Heat
4. Biogas



5. Boreholes for storage
6. Gas burner
7. Control center
8. District heating system

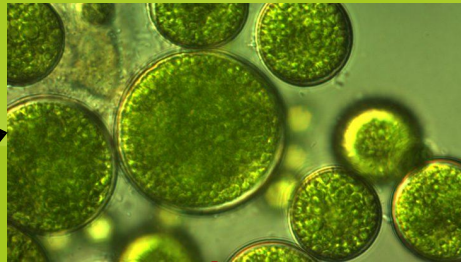


# Photosynthesis



Water

CO<sub>2</sub>



Earth.com

Oxygen

Biomasse

Sugars

## Issues

- Efficiency of the SolarLeaf system:  
conversion of light to biomass 10%  
conversion of light to heat 38%
- For comparison:  
Photovoltaic systems efficiency:  
12-15%  
Solar thermal systems: 60-65%
- CO2 reduction: 6 tonnes per year

- Algae produce up to 5 times as much biomass per hectare than soil-grown plants
- Part of the architectural concept.

## How to Improve ?

- Use more sustainable materials or recycled plastic
- Aesthetic appearance for a better acceptance

6.

## Bocage Urbain

Manage the rain mimicking a bocage



# The concept:

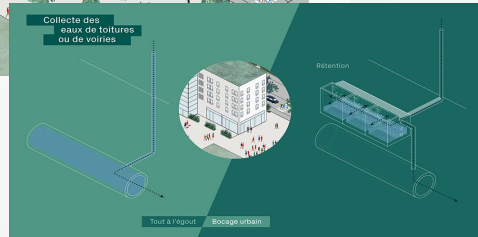
Plants trees and plants in cities



Collects water  
rain

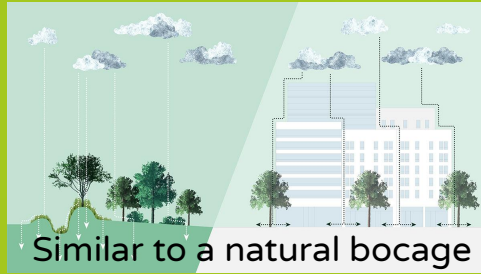


Reorganizes the circulation



Grows in specific modules thanks to  
the water rain

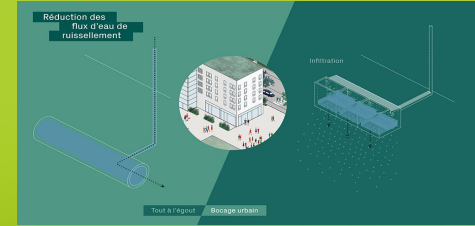




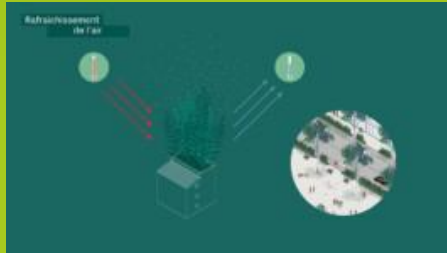
# Water need of plants



EVAPOTRANSPIRATION



Water regulation



Reduce the heat by the  
transpiration



Attract biodiversity



Water need coming from rains



## Principal issues :

- Need a gardener for the cut
- Reorganisation of the city and the underground
- Plants growing in a restrictive space
- Space competition in the city
- Not directly link to the real soil
- Polluted water
- Sealing because of waste

## How to Improve ?

- Use more independant plants
- Use phytodepuration plants/microorganisms
- Imagine an aquaponic/food production system
- Extent the access to the soil
- Method to pick up the waste

Thanks for your attention !



Any questions?



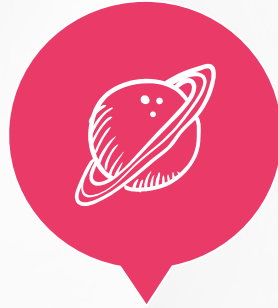


Quotations are commonly printed as a means of inspiration and to invoke philosophical thoughts from the reader.

## This is a slide title

- ▣ Here you have a list of items
- ▣ And some text
- ▣ But remember not to overload your slides with content

Your audience will listen to you or read the content, but won't do both.



# BIG CONCEPT

Bring the attention of your audience over a key concept using icons or illustrations

## You can also split your content

### White

Is the color of milk and fresh snow, the color produced by the combination of all the colors of the visible spectrum.

### Black

Is the color of coal, ebony, and of outer space. It is the darkest color, the result of the absence of or complete absorption of light.

## In two or three columns

### **Yellow**

Is the color of gold, butter and ripe lemons. In the spectrum of visible light, yellow is found between green and orange.

### **Blue**

Is the colour of the clear sky and the deep sea. It is located between violet and green on the optical spectrum.

### **Red**

Is the color of blood, and because of this it has historically been associated with sacrifice, danger and courage.

## A picture is worth a thousand words



A complex idea can be conveyed with just a single still image, namely making it possible to absorb large amounts of data quickly.

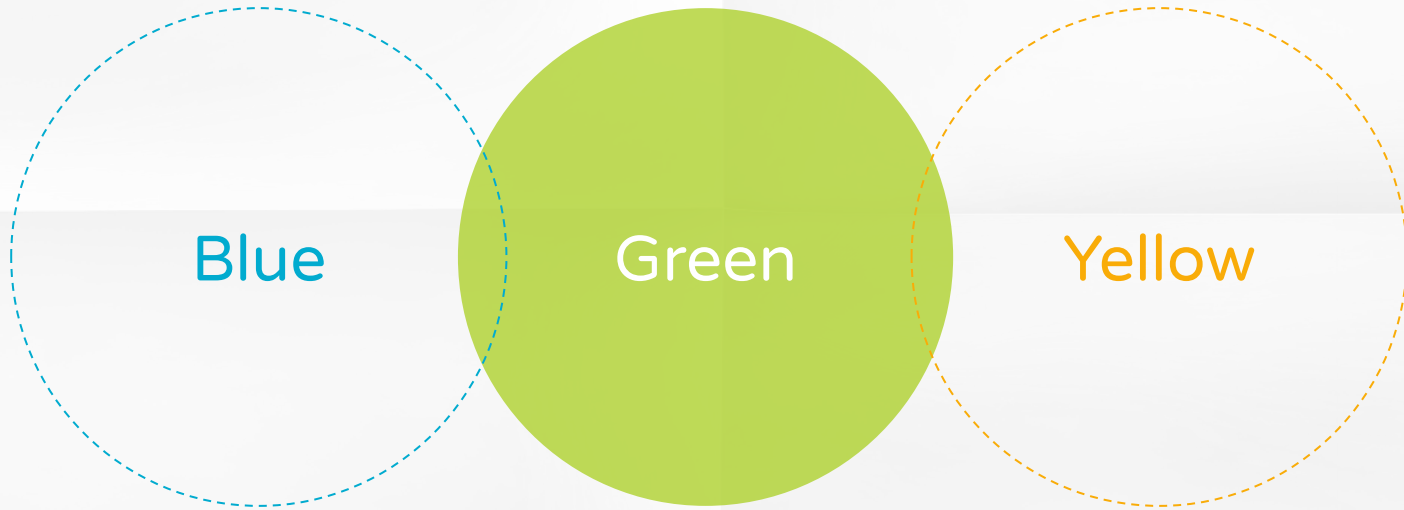




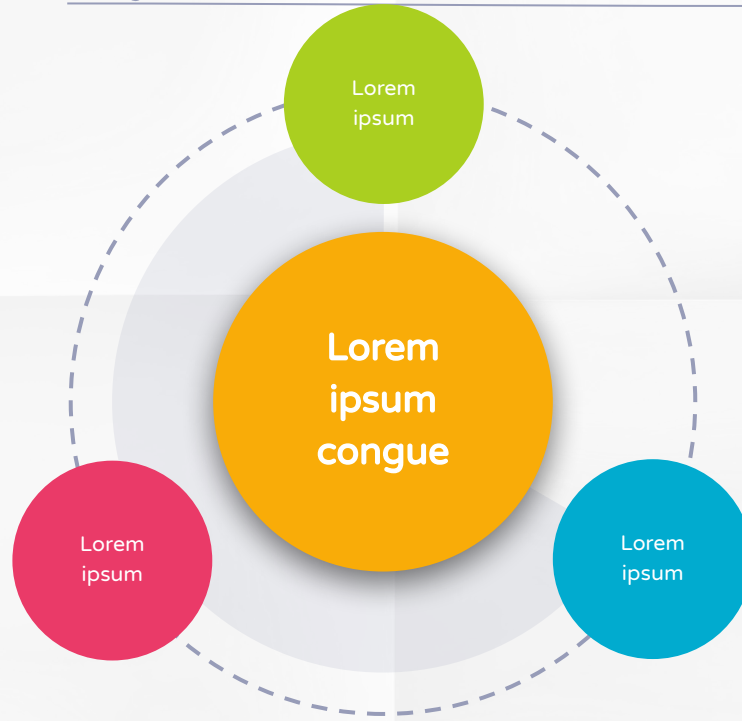
Want big impact?  
Use big image



Use charts to explain your ideas



Or use Diagrams to explain complex ideas



## And tables to compare data

	A	B	C
Yellow	10	20	7
Blue	30	15	10
Orange	5	24	16

# Maps



89,526,124

Whoa! That's a big number, aren't you proud?

89,526,124\$

That's a lot of money

185,244 users

And a lot of users

100%

Total success!



Our process is easy



## Let's review some concepts



### Yellow

Is the color of gold, butter and ripe lemons. In the spectrum of visible light, yellow is found between green and orange.



### Blue

Is the colour of the clear sky and the deep sea. It is located between violet and green on the optical spectrum.



### Red

Is the color of blood, and because of this it has historically been associated with sacrifice, danger and courage.



### Yellow

Is the color of gold, butter and ripe lemons. In the spectrum of visible light, yellow is found between green and orange.



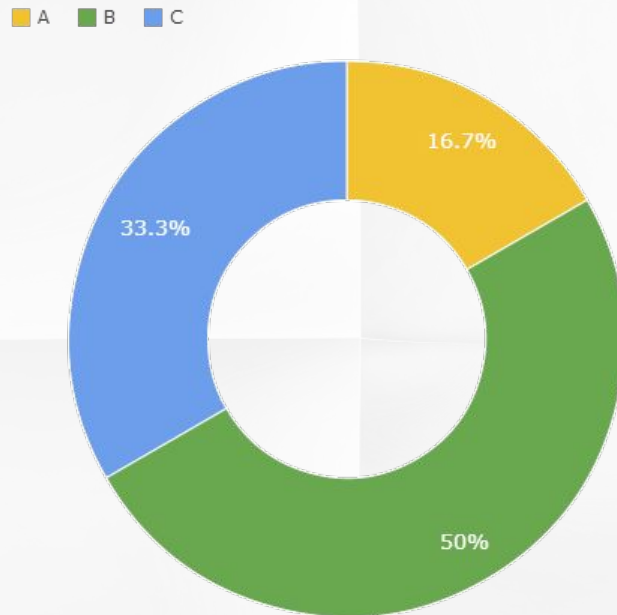
### Blue

Is the colour of the clear sky and the deep sea. It is located between violet and green on the optical spectrum.



### Red

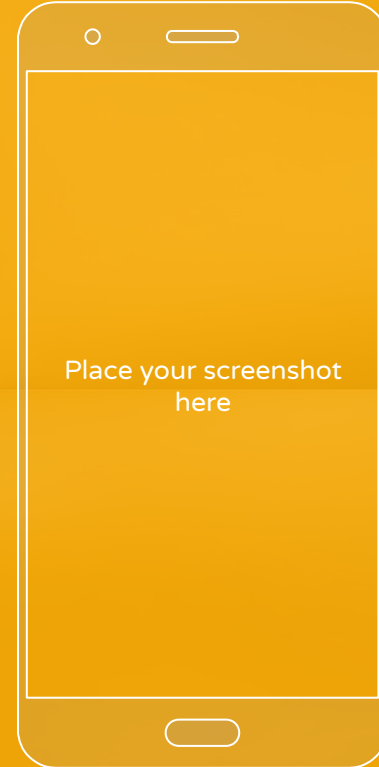
Is the color of blood, and because of this it has historically been associated with sacrifice, danger and courage.



You can copy&paste graphs from [Google Sheets](#)

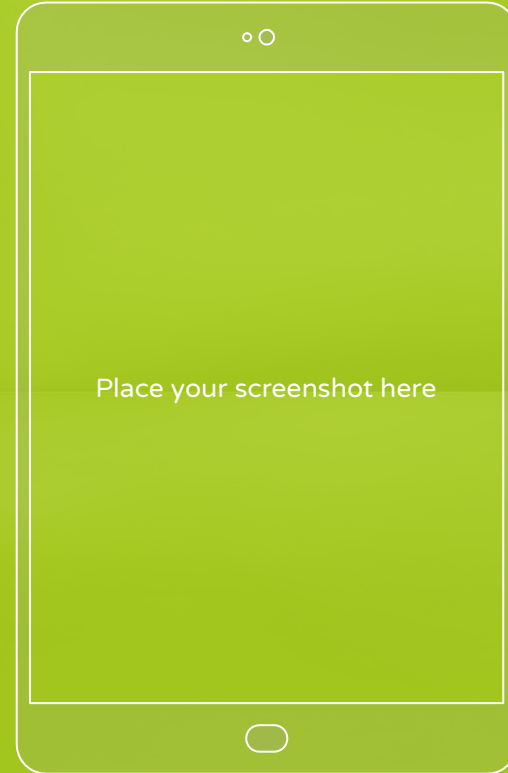
## Mobile project

Show and explain your web,  
app or software projects  
using these gadget  
templates.



## Tablet project

Show and explain your web,  
app or software projects  
using these gadget  
templates.





Place your screenshot here

## Desktop project

Show and explain your web, app or software projects using these gadget templates.



Thanks!

Any questions?

You can find me at @username & user@mail.me

## Credits

---

Special thanks to all the people who made and released these awesome resources for free:

- Presentation template by SlidesCarnival
- Photographs by Unsplash
- Backgrounds by Pixeden

# Presentation design

This presentations uses the following typographies and colors:

- ▣ Titles: **Shadows into light**
- ▣ Body copy: **Varela round**

You can download the fonts on these pages:

<https://www.dafont.com/shadows-into-light.font>

<https://www.fontsquirrel.com/fonts/varela-round>

- ▣ Dark grey **#505670**
- ▣ Light grey **#979cb8**
- ▣ Blue **#01abcf**
- ▣ Yellow **#f9ac08**
- ▣ Magenta **#ea3a68**
- ▣ Green **#aacf20**

*You don't need to keep this slide in your presentation. It's only here to serve you as a design guide if you need to create new slides or download the fonts to edit the presentation in PowerPoint®*



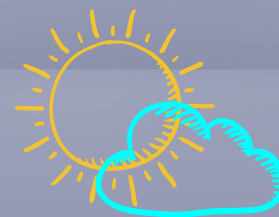
SlidesCarnival icons are editable shapes.

This means that you can:

- Resize them without losing quality.
- Change fill color and opacity.

Isn't that nice? :)

Examples:



**Now you can use any emoji as an icon!**

And of course it resizes without losing quality and you can change the color.

How? Follow Google instructions

<https://twitter.com/googledocs/status/730087240156643328>



and many more...

# Slides Carnival

**Free templates for all your presentation needs**



For PowerPoint and  
Google Slides



100% free for personal  
or commercial use



Ready to use,  
professional and  
customizable



Blow your audience  
away with attractive  
visuals