



AESTHETICS, ECONOMY & FUNCTIONALITY:
THE PHOTOVOLTAIC ROOF T.C.R. (Triactive Coor Roof)
BY DESIGNERGY

TRADITIONAL SOLUTION

PV SYSTEM
ON THE ROOF

PV MODULS

TILES

**OTHER PROTECTIVE
LAYERS**



THE EVOLUTION OF ROOFING

TRADITIONAL SOLUTION

PV SYSTEM
ON THE ROOF

PV MODULS

TILES

**OTHER PROTECTIVE
LAYERS**



NEWER SOLUTION

BIPV REPLACES ONLY
THE TILES

PV MODULS

**OTHER PROTECTIVE
LAYERS**

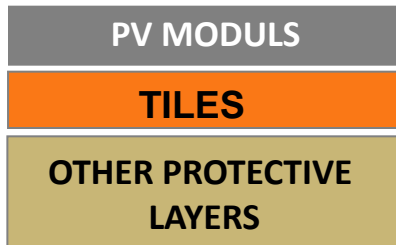


THE EVOLUTION OF ROOFING



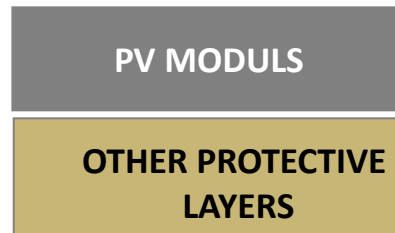
TRADITIONAL SOLUTION

PV SYSTEM
ON THE ROOF



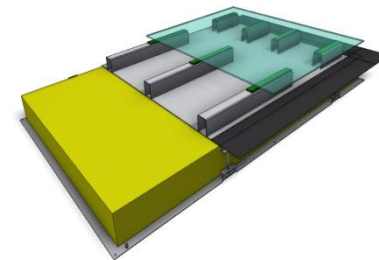
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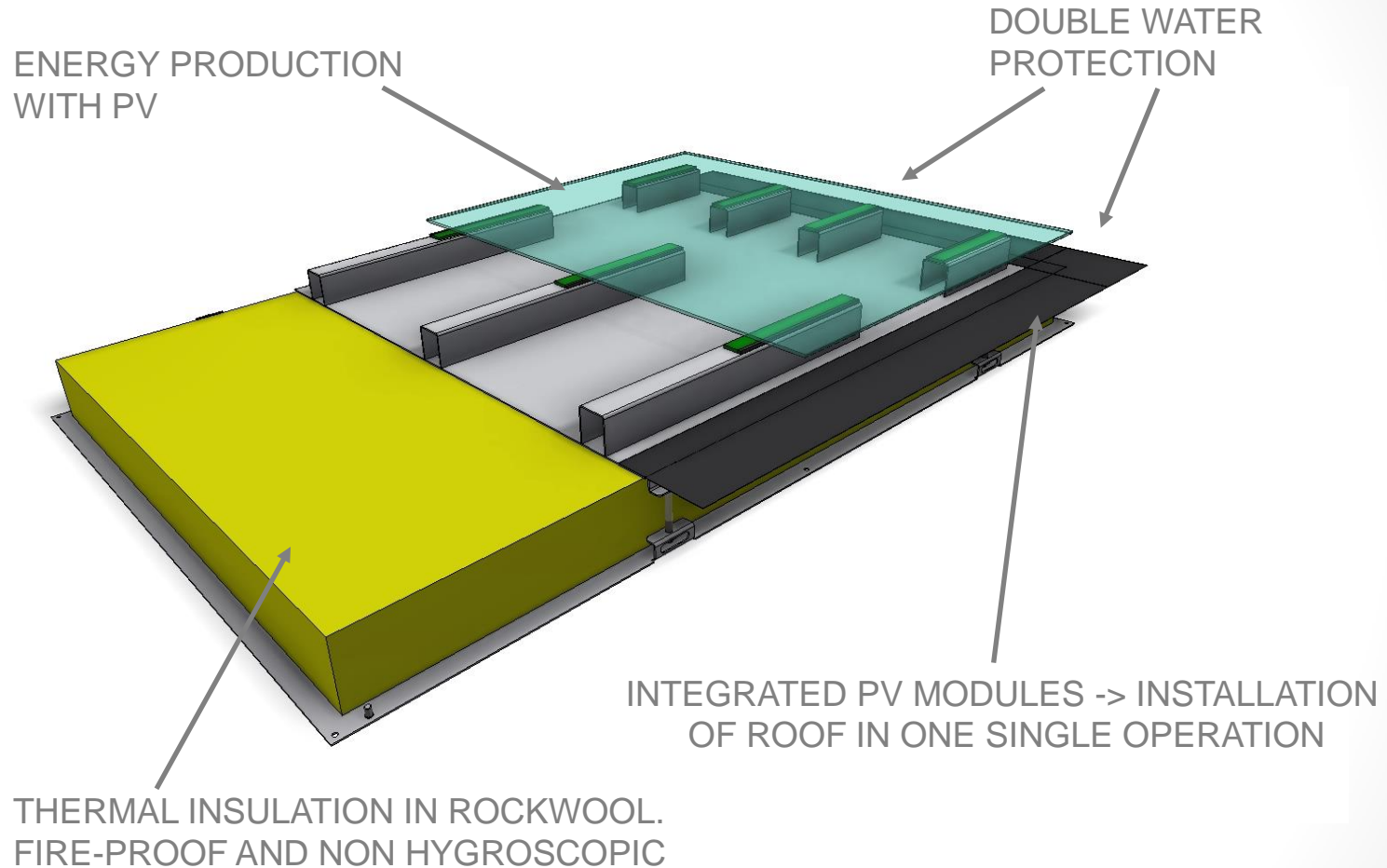


DESIGNERGY SOLUTION

**T.C.R.
FULL INTEGRATION**



FULLY INTEGRATED SOLUTION





TAILORED DUMMY MODULES



NARROW ANGLES EASILY COVERED

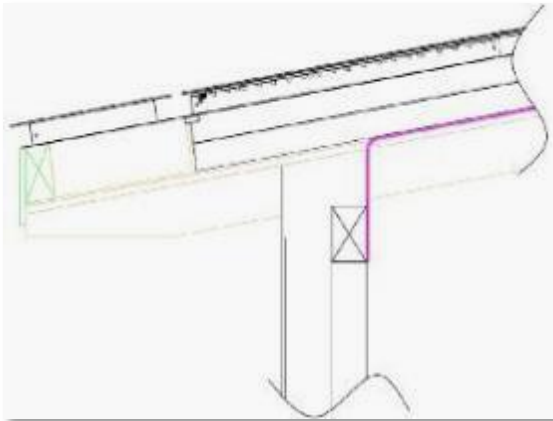
CHIMNEYS AND ROOF WINDOWS
FULLY INTEGRATED



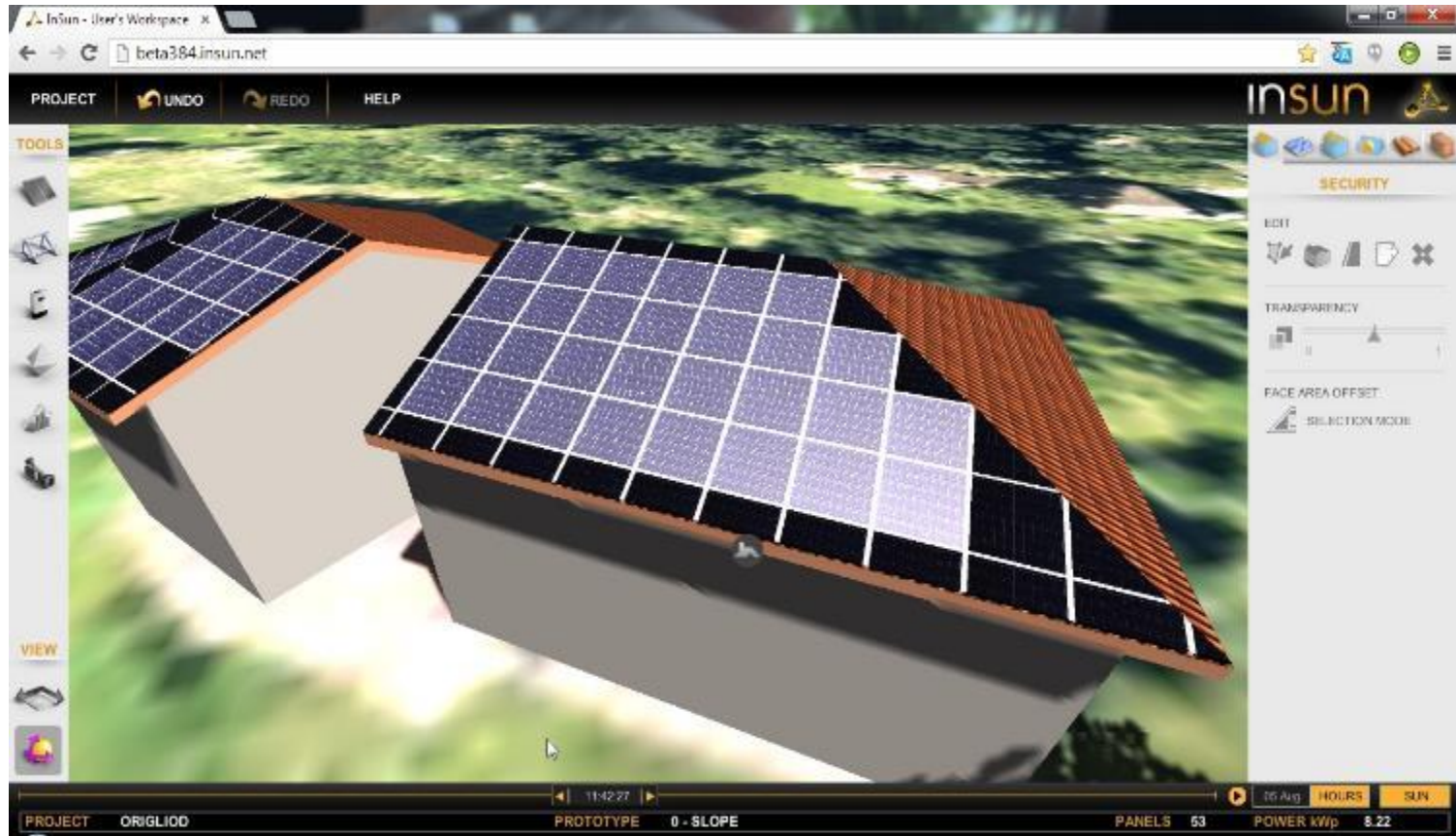
A COMPLETE ROOF SYSTEM

TAILORED METAL SHEET PARTS:

- WATER PROTECTION
- VENTILATION
- AESTHETICS

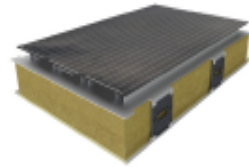


SIMULATION SOFTWARE: EASY ROOF CALCULATION

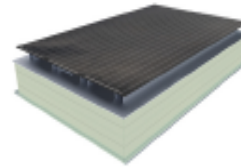


BASED ON GOOGLE MAPS DATABASE
A COMPLETE PROJECT EASILY DEVELOPED: POWER, ENERGY,
CAD DRAWINGS AND PART-LIST

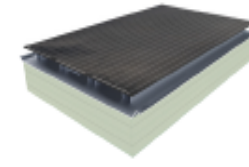
FOR PITCHED ROOF



BEST IN THE WORLD



GREATEST COMPROMIZE

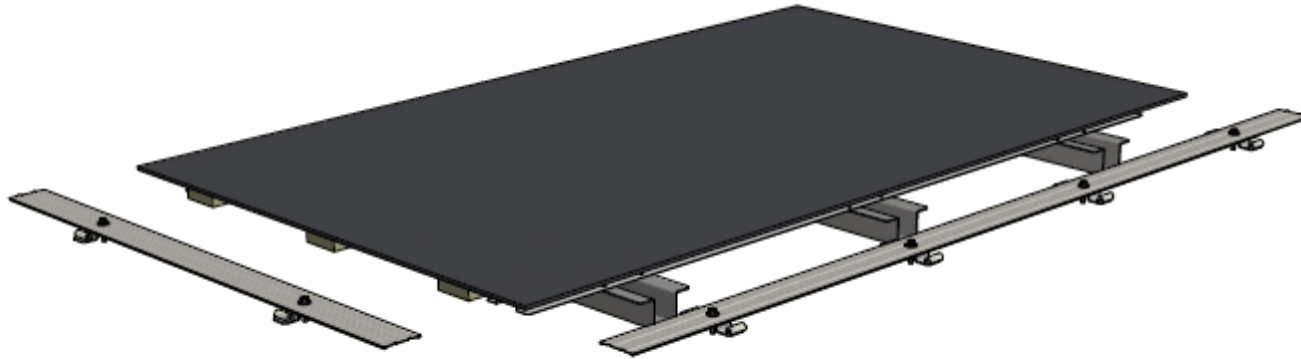


COSTS LIKE A ROOF WITHOUT SOLAR

CHARACTERISTIC	TCR 2100 "PREMIUM"	TCR 610 "STANDARD"	TCR 310 "ECO"
Photovoltaic Power [Wp]	240 with 54 Cells	255 with 60 Cells	250 with 60 Cells
Compression Load [kg/m ²]	>1000	>540	>240
Watertight Layers [#]	3	3	1 [3]
Integrated Solution	Yes	Yes	No [Yes]
Lightning Protection Grid	Yes	Yes	No [Yes]
Thermal Isolating Material	Rockwool	PET- Foam (Rockwool)	PET- Foam (Rockwool)
Metallic Components	Anodized Aluminium	Galvanized Steel	Galvanized Steel
Lamination Materials Photovoltaic	Glass-Glass	Glass-Glass	Glass-Glass (Glass-Backsheet)
Expected Lifetime [Years]	40 +5	30 +5	20 +5
Walkable	Yes	Yes	Yes (No in case of Glass-Backsheet)
Replaceable PV Modules	Yes [No]	Yes	Yes
Swiss made	Yes	Produced in Switzerland	Produced in Switzerland
Price Comparison (pro m ²)	100%	75%	50%

[] Optional

FOR FLAT ROOF



TCR Flatroof



PRE-ASSEMBLED ELEMENTS (Supermodules)



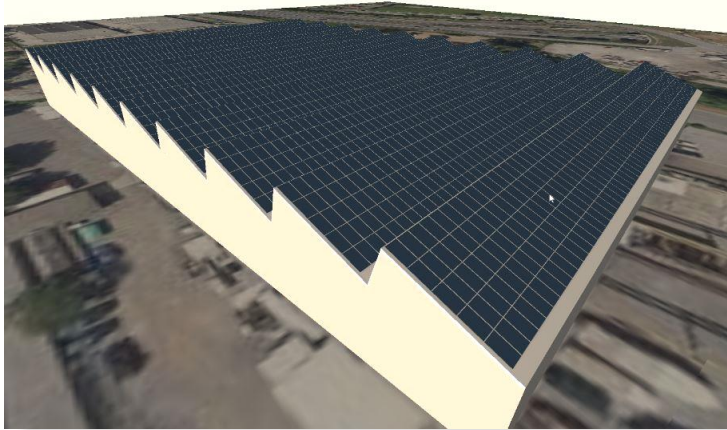
ENGINEERING AND PRODUCTION OF
PRE-ASSEMBLED MODULES (5x1, 6x1,
3x2):

- EASIER TRANSPORT
- QUICK INSTALLATION
- LESS OPERATIONS ON BUILDING SITE

LESS PROBLEMS = PROFIT



1) PORTFOLIO - NEW – Q3 2017



6500 sqm, 1MWp, Lugano – Production Hall with Supermodule
Renovation of 40 years old eternit asbestos roof

1) PORTFOLIO - NEW – Q3 2017



6500 sqm, 1MWp, Lugano – Production Hall with Supermodule
Utility buys at an interesting price module and rights to use electricity 30 years
Building owner gets a... **NEW ROOF FOR FREE!!!!**

2) DESIGNERGY

T.C.R. - Triactive Core Roof

CASE HISTORY “GENEVA/10”

SURELEVATION D’UN IMMEUBLE DE LOGEMENT

July 2017

www.designergy.ch

2) PROJECT GENEVA/10 with Designergy TCR system Vs. Traditional solution:

Total Area	1000	sqm
Total Power	97	kW
Energy production	100.000	kWh/year

COSTS

TRADITIONAL SOLUTION - NO PV:

Concrete flat roof, with no PV installation, expected life 15-20 years

646.000 CHF

DESIGNERGY TCR SOLUTION - WITH PV (as-built):

2 sides with metal structure with inclination 6° + 1 flat roof for HVAC and technical installation + PV with Designergy TCR system, expected life 30-40 years

660.000 CHF

Delta (PV included)

4%

Savings for PV production (free)

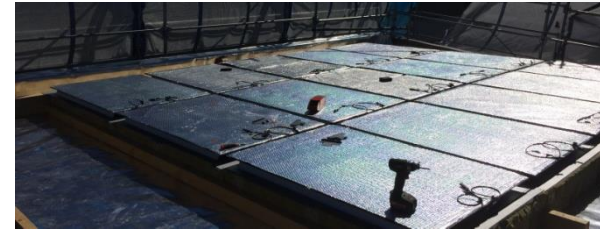
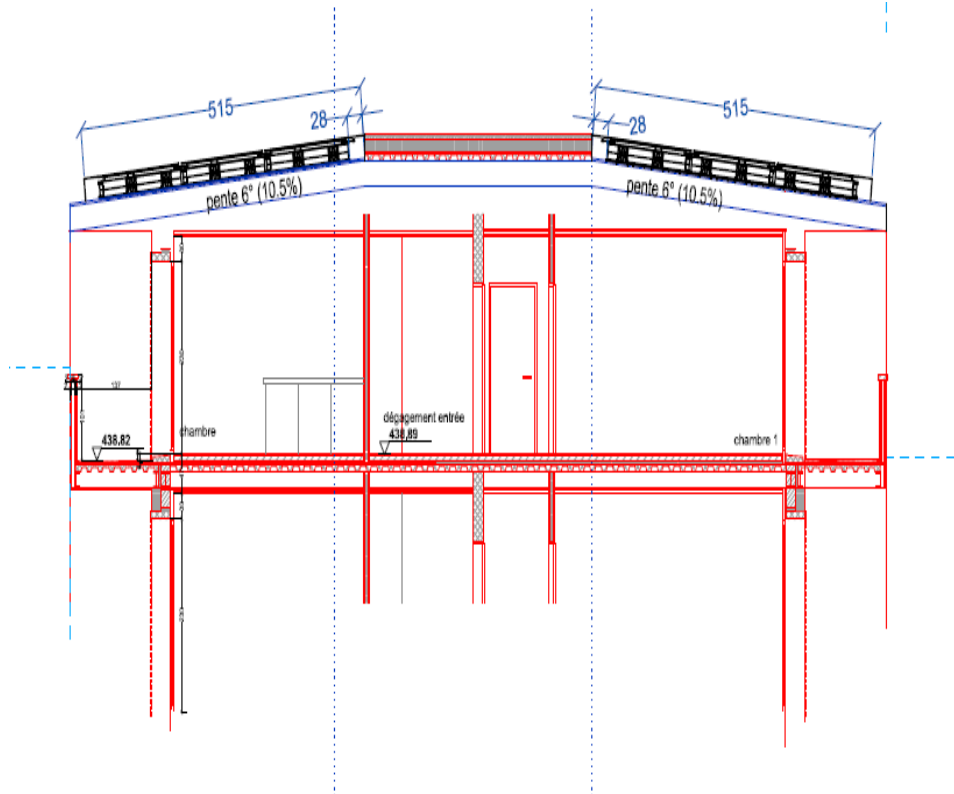
about 15.000-20.000 CHF /year for 30-40 years (the roof is basically for free)

Benefit for PV installation:

not considered in this calculation

THE ROOF WILL BE FOR FREE OR THE ELECTRICITY IS FOR FREE!!!!

BUILDING CONCEPT



work in progress



finished roof

3) PORTFOLIO WITH SUN2WHEEL



55 sqm, 8 kWp, Switzerland – E-mobility parking/charging
Yearly petrol savings from own produced electricity: 4000\$!!!!

THE BUILDING IS FOR FREE!!!!

4) PORTFOLIO



750 sqm, 90 kWp, Switzerland – Production hall – Project winner of
SIMULATED PRODUCTION: 79'000 kWh/Year
REAL PRODUCTION: >90'000 kWh/Year





2000 sqm, 280 kWp, Bern - Production Hall



2000 sqm, 280 kWp, Bern - Production Hall – During installation



100 sqm, 7 kWp, Switzerland - Residential



100 sqm, 7 kWp, Switzerland - Residential



170 sqm, 23 kWp, Switzerland - Warehouse



105 sqm, 10kWp, Switzerland – Residential (TCR 2000)

120 sqm, 11kWp, Switzerland – Residential (TCR 600)

CONSTRUCTION PHYSICS:

- FIRE RESISTANCE WITH HIGHEST FIRE RESISTANT COMPONENTS
- LONG LASTING MOISTURE MANAGEMENT & INSULATING R VALUES >5
- NO THERMAL BRIDGES & LONG LASTING INSULATING R VALUES >5

ELECTRICAL SAFETY:

- INTEGRATED UPPER FARADAY CAGE FOR LIGHTNING SAFETY (ELECTROSUISSE)
- EQUIPOTENTIAL INCLUDED (ELECTROSUISSE)

PHOTOVOLTAIC FEATURES:

- COMES AS ONE PIECE OF ROOF BUT PV MODULES DETACHABLE
- COMPLETE WITH DETAIL ENGINEERING & DUMMIES
- STEP-PROOF LAMINATED MULTI-GLASS PHOTOVOLTAIC MODULES
- HIGHEST COMPRESSION STRENGTH UP TO 1000 kg/sqm (10 m SNOW)
- IDEAL REAR VENTILATION OF MODULES FOR HIGHEST kWh/kWp RATIO

INSTALLATION:

- UNBEATABLE INSTALLATION SPEED AND SIMPLICITY
- ADAPTABLE TO DIFFERENT STRUCTURES

INVESTMENT:

- BEST PRICES OR BEST PRODUCT OR BOTH
- MULTIPLE CERTIFICATIONS (IEC,..) AND WARRANTIES (30 YEARS: >85% POWER)
- SERVICING HIGHLY REDUCED THANKS TO FRAMELESS PV MODULES & NO OBSTACLES

ENVIRONMENTAL FOOTPRINT:

- 1 TON CO2 PER SQM SAVED OVER MINIMUM 30 YEARS LIFECYCLE
- ALL MATERIALS ARE RECYCLABLE, EASILY AVAILABLE & NON-TOXIC

SUMMARY AND OUTLOOK IN PILOT MARKET **SWITZERLAND** (transition **B2C → B2B**):

- INSTALLED BASE 2014 – 2016 0,4 MWp
- INSTALLED BASE 2016 >1,5 MWp
- NEGOTIATION PIPELINE 2017-2018: >30 MWp

- **NEGOTIATING WITH AND LOOKING FOR INTERNATIONAL PARTNERS (LICENSING → JV) Europe, India, Africa, USA, Asia**

DESIGNERGY B2B PROGRAM

win-win teamworking

A project with Designergy TCR materials requires the strict cooperation between some players:



- Architect / Engineer
- Energy manager
- Owner/investor
- Roofing specialist
- Tinsmith
- Electric installer

DESIGNERGY B2B PROGRAM

What we offer to our Partners



- Layout/Project of TCR Elements
- Technical support for the metal parts (interface with roof)
- Supply of TCR materials and accessories
- Tools for the installation
- On site coordination and inspection
- Installation manuals and documentation

2011-2013:

DESIGNERGY'S TEAM DEVELOPS TCR
CONCEPT IN COLLABORATION WITH
SUPSI-ISAAC (Lugano)



2012-2013:

FIRST PROTOTYPES



HQ IN SAN VITTORE (CH):

- R&D, production, offices



INDUSTRIAL PARTNERS:

- Sika/Dow Corning
- Sunage/Trina
- Flumroc/Rockwool
- Sonnen Batterien

Potential Partner:

- Flextronics



2011-14:

- Best Business Idea Award 2010 in the Canton of Ticino, sponsored by BSI Bank-
- Microcredit City of Lugano Prize for Innovative Business (2010)
- Swiss Federal Commission for Technology & Innovation (CTI) Project 2011-2013 to Support Industrial Development
- 2.Prize Swissparks Startups 2013 organized by all Swiss Start-up incubators
- TOP 100 Swiss Startup 2013, 2015 and 2016 organized by IFJ
- Venturekick Stages 1-2-3 (2011-2012) organized by IFJ and Gebert Rüt Foundation
- CTI Label 2013

2015:

- Designergy obtained as first Company the financial support of Technologiefonds of Swiss Federal Office for the Environment (FOEN) to foster sales ramp-up

2016:

- **WATT D'OR** by Swiss Federal Office of Energy (SFOE)
- Canton GR Economic Association Innovation Price



TRAINING: Designergy Academy



REFERENCES - see www.designenergy.ch

Haldenstein

Graubünden



00:20

Vezia

Ticino



00:20

Installation of 44 TCR 2054 modules

Rovio

Ticino



00:20

Installation of 32 TCR 2054 modules

Building type	Commercial
Work type	Renewal
Location	Haldenstein GR
Number of modules	170

Location	
Total roof area (m2)	
Total photovoltaic area (m2)	
Commissioning	04/2016
Number of modules	44
Modules type	TCR 2054
Total roof performance (KWp)	11
Produced energy (KWH)	10600 (planned)

Building type	Private
Work type	New building
Location	Rovio TI
Total roof area (m2)	55
Total photovoltaic area (m2)	52
Commissioning	06/2016
Number of modules	32
Modules type	TCR 2054
Total roof performance (KWp)	8
Produced energy (KWH)	7150 (planned)



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