DESIGNERGY®
structurally integrated solar building solutions

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

KIEV ENERGY FORUM 23 NOVEMBER 2017

DANIEL LEPORI CEO

THE EVOLUTION OF ROOFING

TRADITIONAL SOLUTION

PV SYSTEM
ON THE ROOF

PV MODULS

TILES

OTHER PROTECTIVE LAYERS

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NEWER SOLUTION

BIPV REPLACES ONLY
THE TILES

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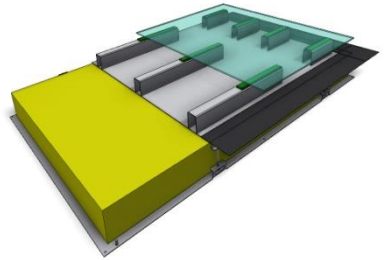
DESIGNERGY SOLUTION

T.C.R.
FULL INTEGRATION

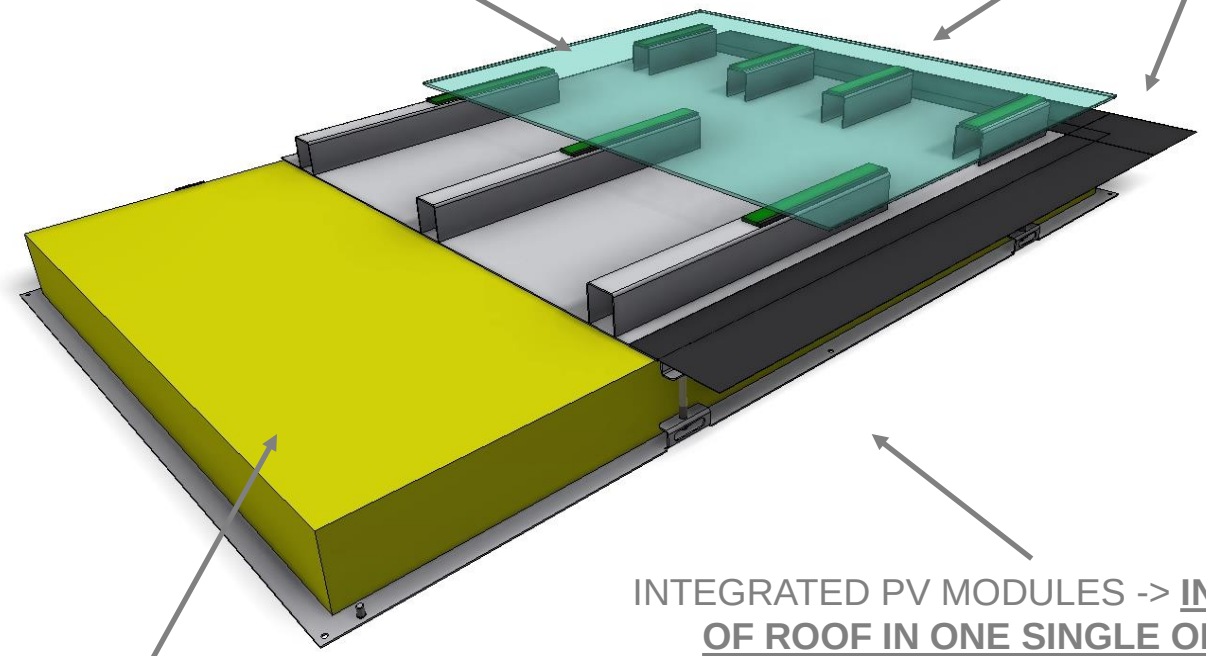
TCR ELEMENTS



TCR: FULLY INTEGRATED SOLUTION

CLEAN ENERGY
WITH SOLAR PV

DOUBLE **WATER PROTECTION**



INTEGRATED PV MODULES -> **INSTALLATION OF ROOF IN ONE SINGLE OPERATION**

THERMAL INSULATION FOR
SAVING ENERGY

Several patents granted and pending

DESIGNERGY = DESIGN + ENERGY

TAILORED DUMMY MODULES

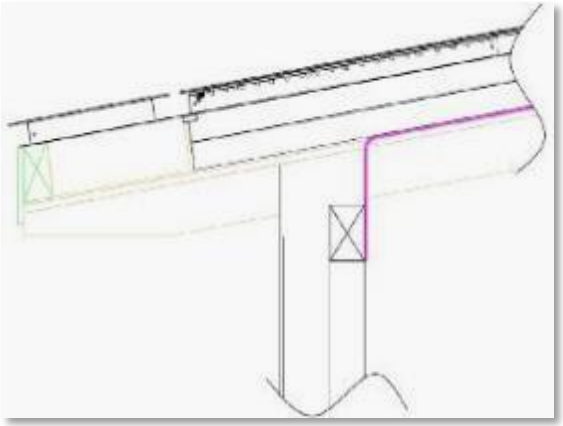
NARROW ANGLES EASILY COVERED

CHIMNEYS AND ROOF WINDOWS
FULLY INTEGRATED

A COMPLETE ROOF SYSTEM

TAILORED METAL SHEET PARTS:

- WATER PROTECTION
- VENTILATION
- AESTHETICS



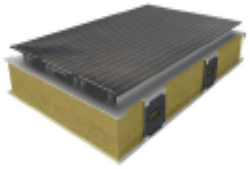
DESIGNERGY

SIMULATION SOFTWARE: EASY ROOF CALCULATION

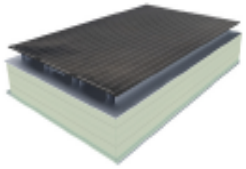
BASED ON GOOGLE MAPS DATABASE
A COMPLETE PROJECT EASILY DEVELOPED: POWER, ENERGY, CAD DRAWINGS AND PART-LIST

DESIGNERGY

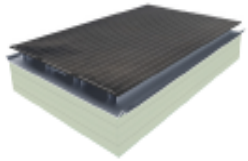
FOR PITCHED ROOF



BEST IN THE WORLD



GREATEST COMPROMIZE



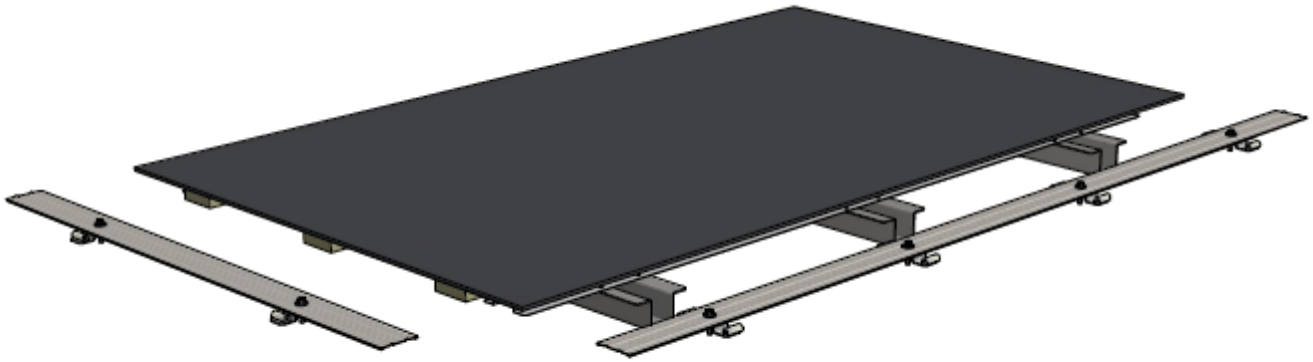
COSTS LIKE A ROOF WITHOUT SOLAR

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/m²)	>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 cae of Glass-Backsheet)
Replaceable PV Modules	Yes (No)	Yes	Yes
Swiss made	Yes	Produced in Switzerland	Produced in Switzerland
Price Comparison (pro m²)	100%	75%	50%

( ) Optional

All values are an example and subject to change

FOR FLAT ROOF



TCR Flatroof

CASE 1 BARBENGO-LUGANO INDUSTRY WITH DESIGNERGY SUPERMODULES

ENGINEERING AND PRODUCTION OF PRE-ASSEMBLED SUPERMODULES (1mx10m) including everything from ceiling to solar photovoltaic module:

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

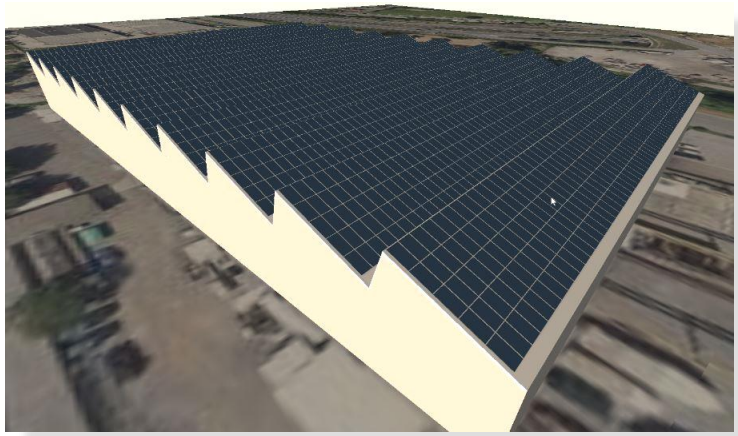
LESS PROBLEMS = PROFIT

CASE 1 BARBENGO-LUGANO INDUSTRY WITH DESIGNERGY SUPERMODULES

Supermodules are transported directly from the factory to the construction site by truck…

... and mounted in just a few minutes

CASE 1 BARBENGO-LUGANO INDUSTRY WITH DESIGNERGY SUPERMODULES



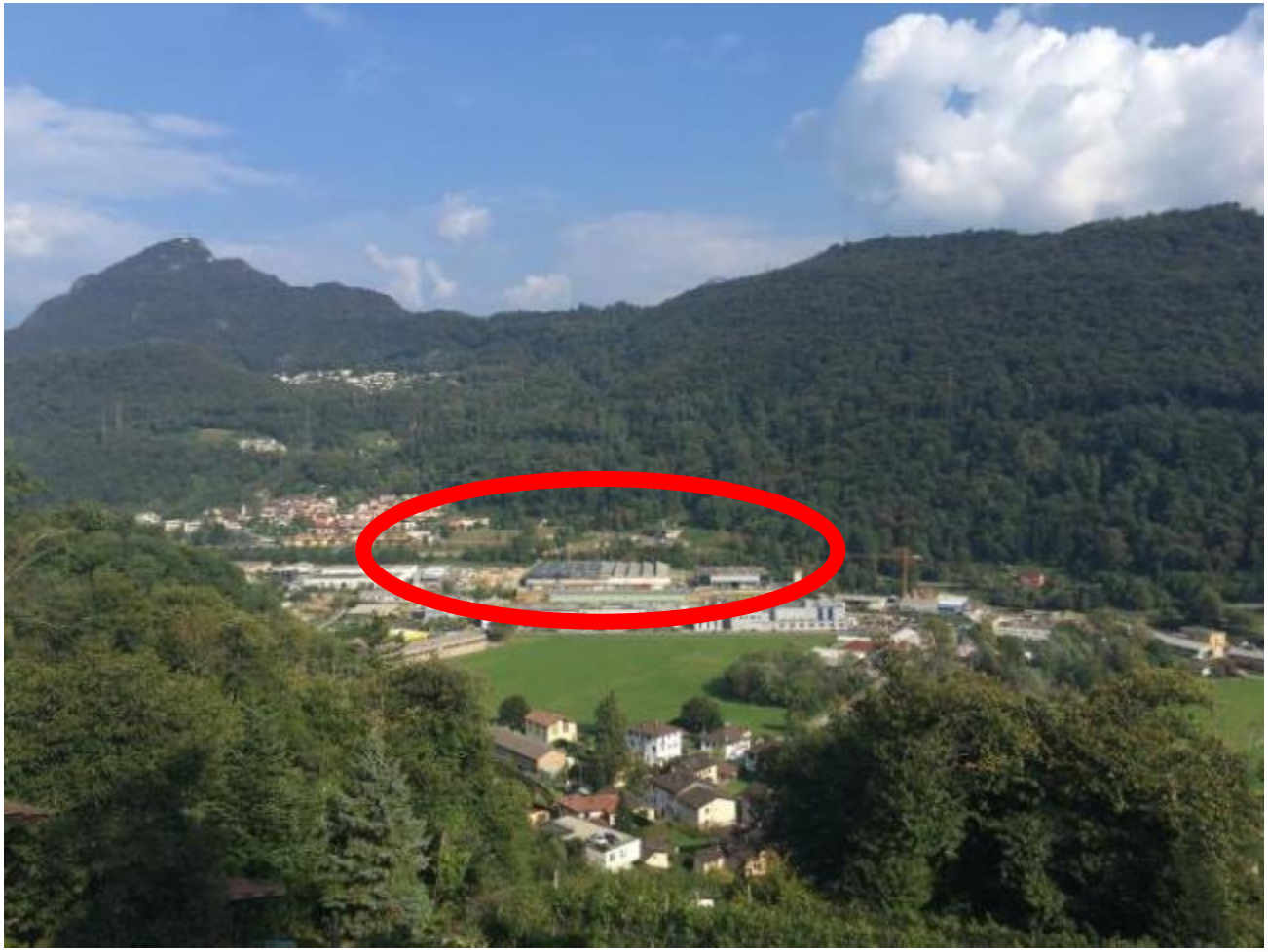
- 6500 sqm, 1MWp, Lugano – Production industry Hall with Supermodule
- Renovation of 40 years old ethernit-asbesto roof

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!!!!

CASE 1 BARBENGO-LUGANO INDUSTRY WITH DESIGNERGY SUPERMODULES

- BARBENGO/LUGANO is an IMMENSE SUCCESS SO FAR (60% faster than planned);
- In this picture 50% is done (left part) while the planning was expecting only 30% done!



T.C.R. - Triactive Core Roof
CASE HISTORY "GENEVA/10"

"SURELEVATION D'UN IMMEUBLE DE LOGEMENT" – ELEVATION OF A RESIDENTIAL BUILDING SUPPORTED AS SFOE PILOT PROJECT

CASE 2 GENEVA RESIDENTIAL WITH DESIGNERGY TCR

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 (according to quotations)**

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

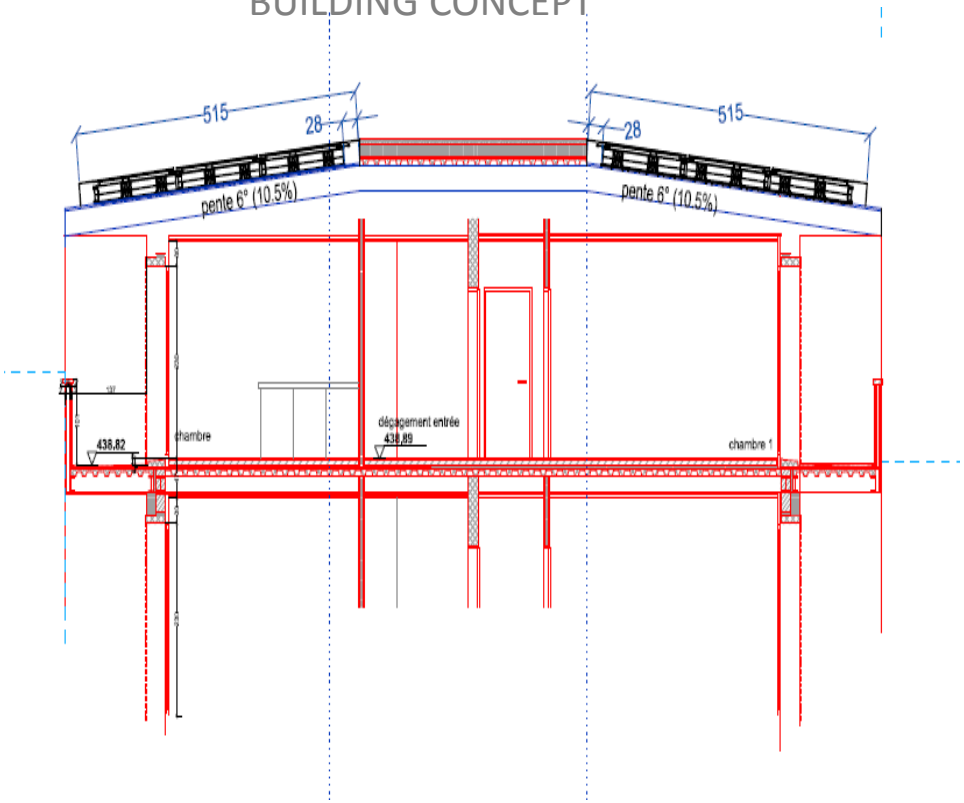
660.000 **CHF (according to quotations and execution)**

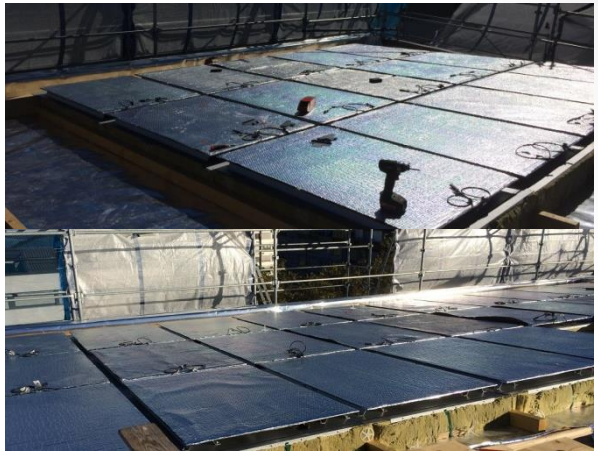
DELTA (PV included only in Designergy)	**4 % (in 2016 but in 2017 <0% → Designergy costs less than a standard roof)**
Savings for PV production	about 15.000-20.000 CHF /year for 30-40 years (the roof is basically for free)
Benefit for PV installation:	not considered in this calculation

THE ROOF WILL BE FOR FREE AS IT GETS PAID BACK BY THE SALE OF UNSUBSIDIZED ELECTRICITY OR THE ELECTRICITY IS BASICALLY FOR FREE AS THE DELTA BETWEEN THE STANDARD SOLUTION AND THE DESIGNERGY SOLUTION IS INSIGNIFICANT!!!!

CASE 2 GENEVA RESIDENTIAL WITH DESIGNERGY TCR

BUILDING CONCEPT





work in progress

finished roof

CASE 3 ROVIO GARAGE FOR 3 E-CARS DESIGNERGY AND SUN2WHEEL

55 sqm, 8 kWp – E-mobility parking/charging for 3 electric cars plus second life recycled car-battery used as stationary buffer battery; the energy from solar roof and the buffer battery allows the three cars to drive 40'000 km per year!
Yearly petrol savings from own produced electricity: 4000CHF!!!!

THE BUILDING WILL BE FOR FREE AFTER 25 YEAS OF PETROL SAVINGS!!!!

4) PORTFOLIO

750 sqm, 90 kWp, Switzerland – Production hall – Project winner of watt d'or 2016
SIMULATED PRODUCTION: 79'000 kWh/Year
REAL PRODUCTION: >90'000 kWh/Year

PORTFOLIO - NEW – Q3 2017

2000 sqm, 280 kWp, Bern - Production Hall

PORTFOLIO - NEW – Q3 2017

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

PORTFOLIO - NEW – Q3 2017

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

PORTFOLIO

100 sqm, 7 kWp, Switzerland - Residential

PORTFOLIO

100 sqm, 7 kWp, Switzerland - Residential

DESIGNERGY

PORTFOLIO

170 sqm, 23 kWp, Switzerland - Warehouse

PORTFOLIO

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

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

TCR IS A 360° TOTAL SOLUTION

- CONSTRUCTION PHYSICS
- ELECTRICAL SAFETY
- PHOTOVOLTAIC FEATURES
- INSTALLATION SIMPLICITY
- INVESTMENT
- ENVIRONMENTAL FOOTPRINT

DESIGNERGY TODAY

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

- GROWING 150% YEAR OVER YEAR

- NEGOTIATION PIPELINE 2018-2019: >30 MWp

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

  - NEGOTIATION PIPELINE 2018-2019: >50 MWp

DESIGNERGY B2B PROGRAM
win-win teamworking

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

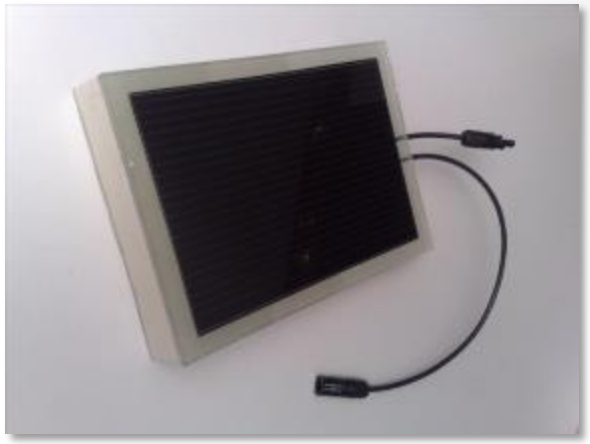
- Architect / Engineer
- Energy manager
- Owner/investor
- Roofing specialist
- Tinsmith
- Electric installer

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

DESIGNERGY SINCE 2011

2011-2013:
DESIGNERGY'S TEAM DEVELOPS TCR CONCEPT IN COLLABORATION WITH SUPSI-ISAAC (Lugano)



2012-2013:
FIRST PROTOTYPES

DESIGNERGY TODAY

HQ IN SAN VITTORE (CH):
- R&D, production, offices

INDUSTRIAL PARTNERS:
- Sika/Dow Corning
- Sunage/Trina
- Flumroc/Rockwool
- Sonnen Batterien

Potential Partner:
- Flextronics

AWARDS / REWARDS

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 organiazed 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 Rüf Foundation
- CTI Label 2013

2015:

- Designergy obtained as first Company the financial support of Technologiefonds of Swiss Federal Office for the Environnment (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.designergy.ch

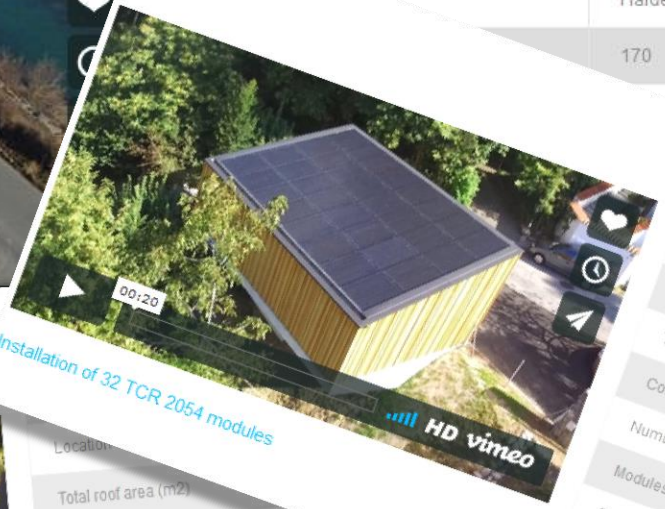
Haldenstein

Graubünden

Building type	Commercial
[illegible] type	Renewal
[illegible]	Haldenstein GR
[illegible]	170

Rovio

Ticino



Installation of 32 TCR 2054 modules

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)

Vezia

Ticino

Installation of 44 TCR 2054 modules

[illegible]	[illegible]
Total roof area (m2)	[illegible]
Total photovoltaic area (m2)	[illegible]
Commissioning	04/20[illegible]
Number of modules	44
Modules type	TCR 2054
Total roof performance (KWP)	11
Produced energy (KWH)	10600 (planned)

watt d'or 2016

Technologiefonds
BÜRGT FÜR INNOVATIVEN KLIMASCHUTZ

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structurally integrated solar building solutions

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