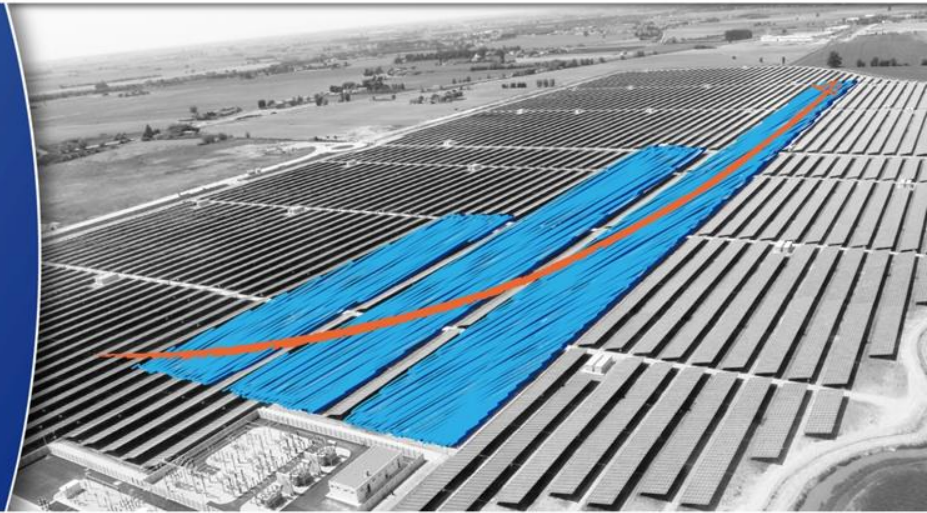


PV in shared multi-story buildings: Present and future



Mira Teoh
Photovoltaic Austria



PHOTOVOLTAIC
AUSTRIA
FEDERAL ASSOCIATION



AUSTRIAN NATIONAL IMPLEMENTATION GUIDELINE

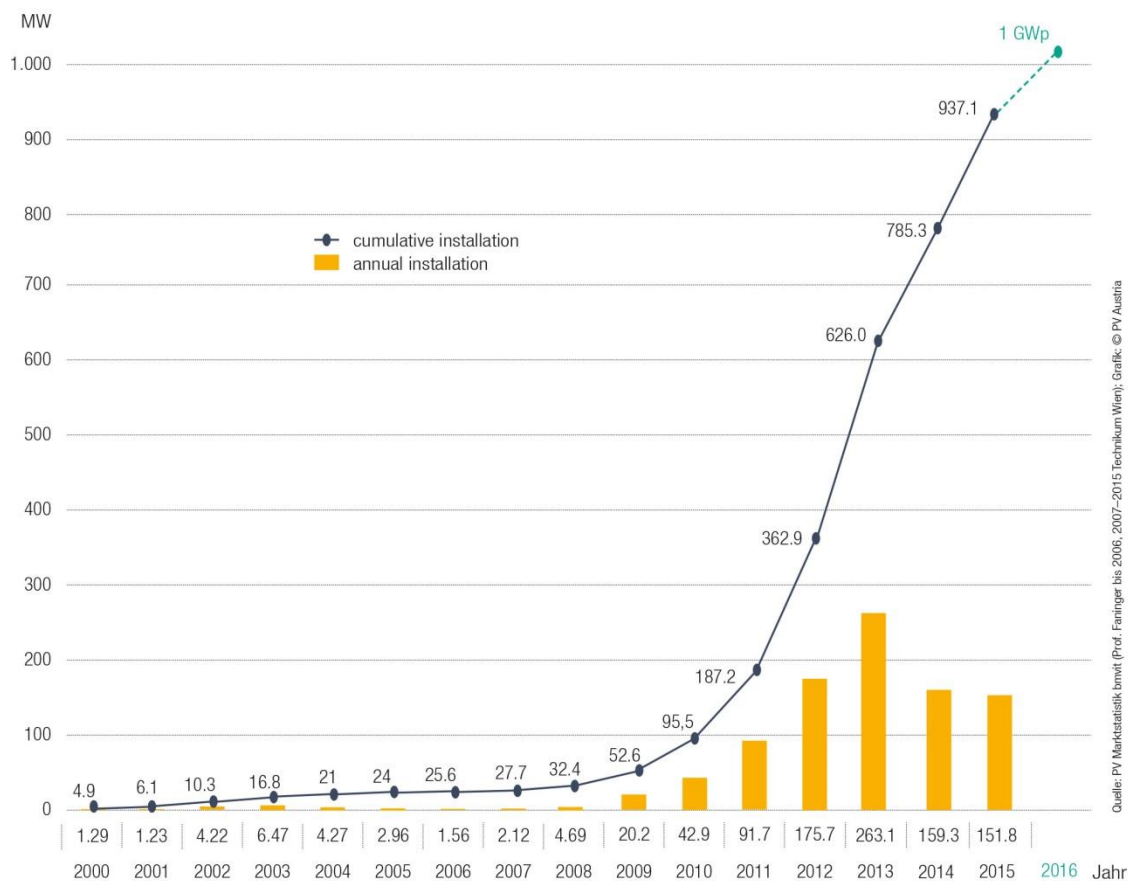


Focus on self-consumption models:
Most promising business model in all segments

Application segments

- 1. Single-family house:** common practice with much potential
- 2. Shared multi-story buildings:** challenges and opportunities

1 GWP OF PV CAPACITY



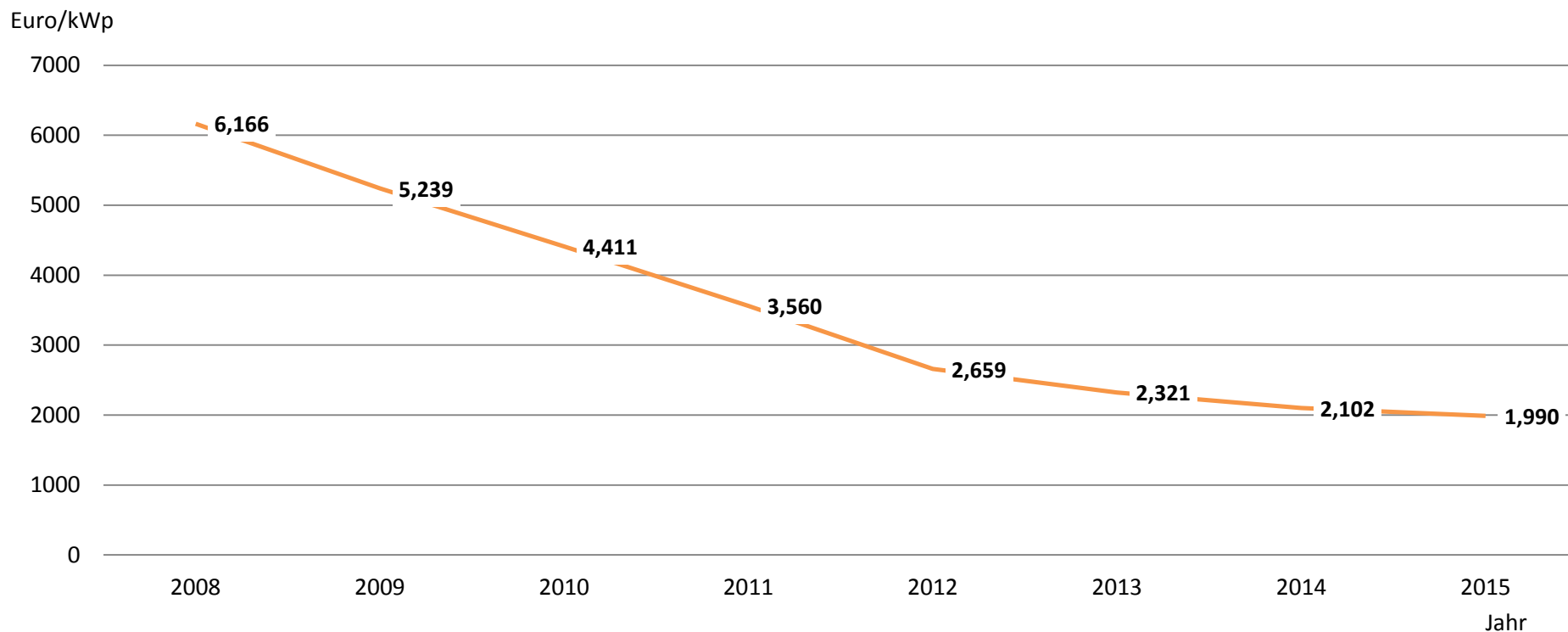
- Milestone of 1 GWp reached this summer
- raising PV's share of total electricity consumption to 1.7%
- enough to supply 300,000 households

AUSTRIA'S PV-MARKET AND FRAMEWORK CONDITIONS

- Stable annual market growth of 150-160 MWp since 2012
- Market characterized by small and medium-sized systems (almost 2/3 of the existing 85,000 PV systems <5 kWp)
- Rooftop PV systems most common
 - 86% of all newly installed PV systems in 2015
 - 12% ground-mounted
- Subsidies have been reduced, but still play a significant role
- Low energy prices, especially for industry
- Reduced red tape though some barriers remain

FALLING PV SYSTEM PRICES

Between 2008 and 2016 system prices fell by 68% (5 kWp)



SINKING FEED-IN TARIFFS

Feed-in tariffs 2002 – 2016 (5-200 kWp)





PV IN SHARED MULTI-STORY BUILDINGS

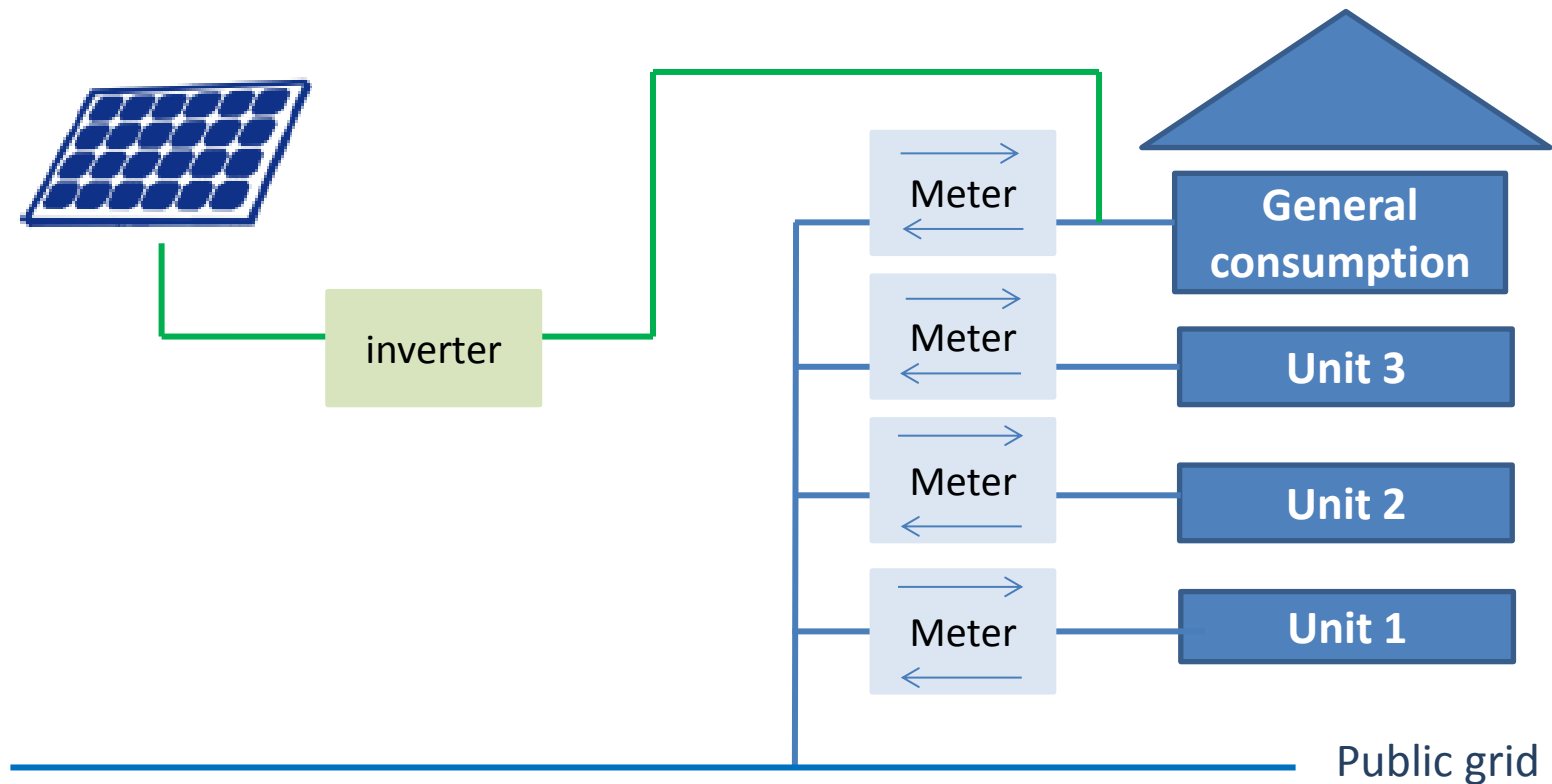
CURRENT SITUATION

- Large market potential – 60% live in apartment buildings, additionally offices, shopping centres
- Current regulatory framework – Electricity Act :
 - Assigning a single PV system to several consumers not possible
 - Joining several metering points together is prohibited
 - Problem of transmitting electricity through the public grid (within the building)
 - Grid operator monopoly: grid licence necessary to use public grid

1. PV for general consumption

- Operation & installation: building owner/operating cooperative
- Use of PV electricity: only for buildings's general consumption
- Advantages: reduced building operating costs, possibility of indirect PV use for tenants
- Challenges: optimizing self-consumption (possibly via heat and hot water)
- Most suitable application segment: shopping centres

GENERAL CONSUMPTION



Source: see W. Amann, StromBIZ (2016)

2. Several technically separate PV systems

Operation & installation: building owner; tenants rent PV system

Use of PV electricity: within the individual flats/offices

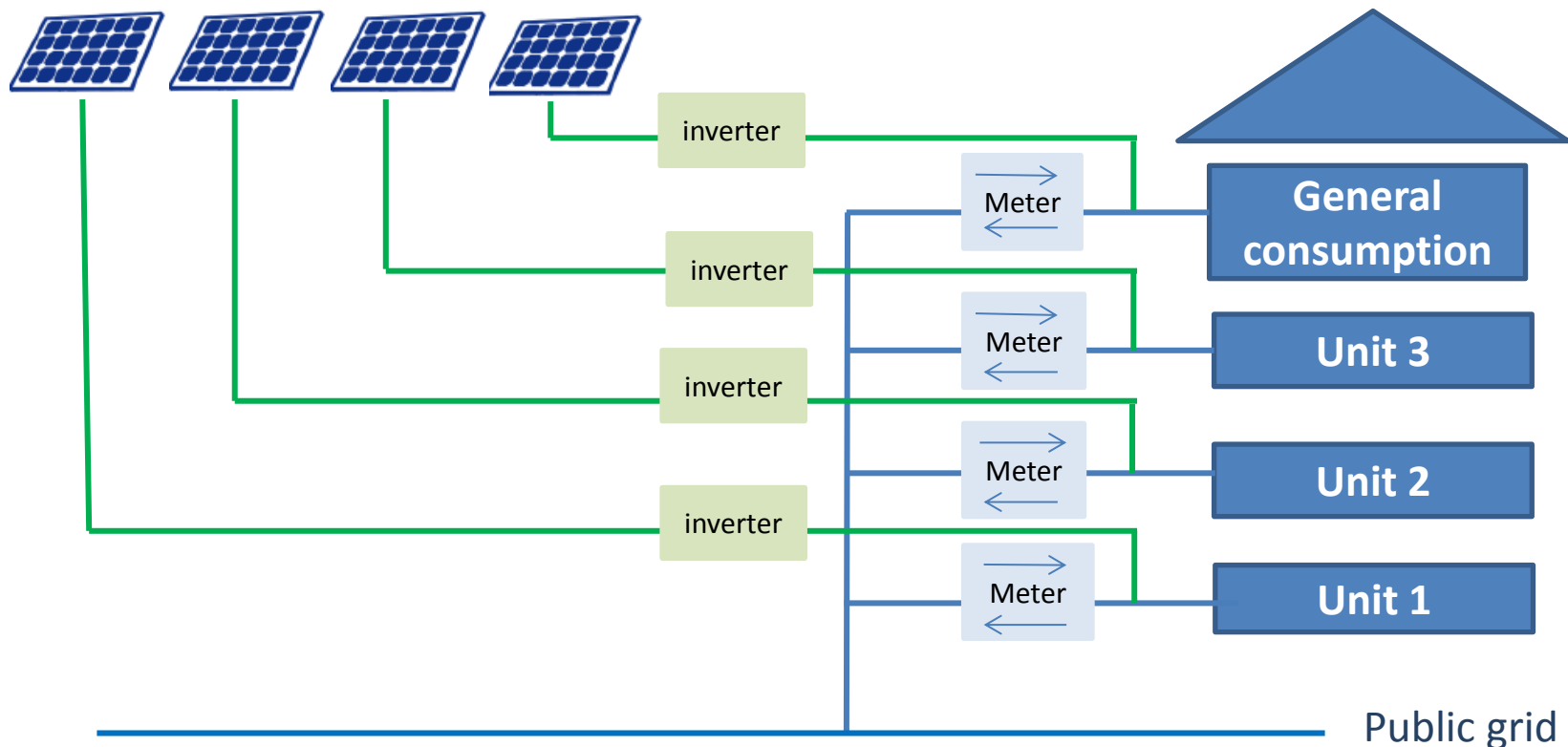
Legally possible because: separate PV system per flat/offices connected via a direct wire

Advantages: electricity consumption within the flat/office

Challenges: higher investment costs due to small system prices, low energy production

Most suitable application segment: new apartment buildings

TECHNICALLY SEPARATE PV SYSTEMS



Source: see W. Amann, StromBIZ (2016)

EXAMPLE: NEW APARTMENT BUILDING

- 75 flats in Leoding, Upper Austria
- Each flat is equipped with 4 PV panels
- Either purchased together with the flat or rented



Foto credit: LEWOG LEONDINGER WOHNERLEBNIS GMBH

Amendment of Electricity Act towards the end of 2016

- Enabling common PV systems
- Introduction of the term „main power line“ (within the building) -> no longer part of public grid
- Participation must be optional
- All participants must own a (symbolic) share in the PV system

➔ enabling new, economically attractive business models

Common PV system

- PV system connected to the „main power line“
- measurement of each unit's electricity consumption via smart meter

Operation & installation: operating cooperative

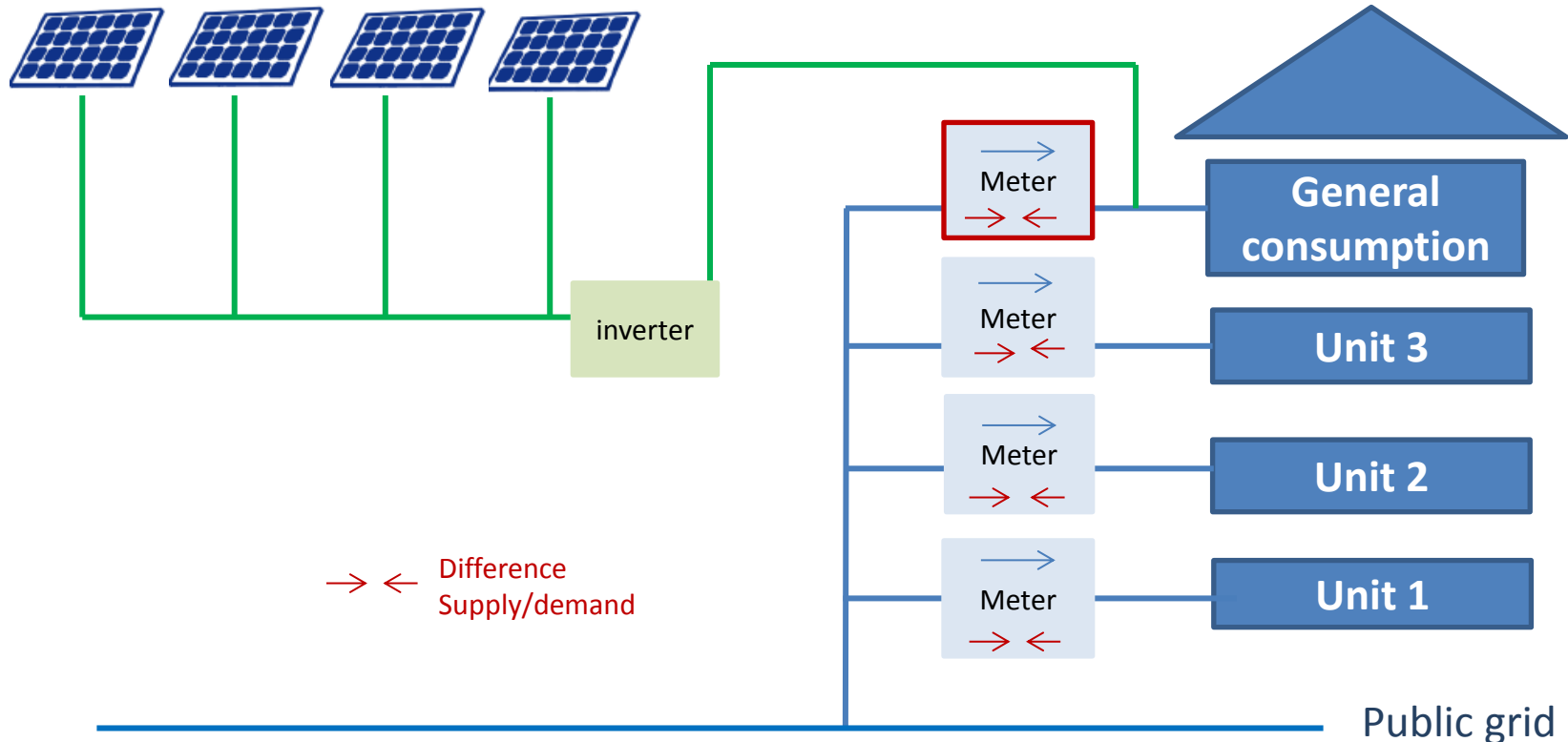
Use of PV electricity: within the individual flats/offices

Advantages: higher share of self-consumption

Challenges: billing and how PV electricity is shared, establishing operating cooperative

Most suitable application segments: (new) apartment buildings, offices, shopping centres

COMMON PV SYSTEM



Source: see W. Amann, StromBIZ (2016)

COMPARISON : PROFITABILITY

	General consumption	Separate systems	Common PV system
System size	10 kWp	2 kWp/per system	20 kWp
System cost	12,250 EUR (inkl. subsidy)	3,600 EUR	21,000 EUR
Feed-in tariff	8.24 cents/kWh	-	-
Self-consumption	20%	35%	90%
Financing	Loan	Self-funded	Loan
Amortisation	19.5 years	16.82 years	9.81 years
Project rentability	2.94%	3.55%	10.18

CONTRACT TEMPLATES

3 contract templates:

- Roof rent contract
- PV system rent contract („Pacht“)
- Contract for the establishment of an operating cooperative

Mira Teoh
Photovoltaic Austria



PHOTOVOLTAIC
AUSTRIA
FEDERAL ASSOCIATION

