

BIPV Technologies and Markets 2017-2024

Published February 09, 2017

Report # Nano-901

Summary

Building-integrated photovoltaics (BIPV) is being re-booted. Originally a strategy to hide ugly solar panels, then a way to create spectacular architectural effects, BIPV is now being repositioned as a multi-functional building product with a broad addressable market. This “third-generation” BIPV can – as in the Tesla offering – provide a sustainable energy source combined with an attractive high-end building product at a cost that is less than buying the energy source and building product separately.

n-tech Research has been following the evolution of the BIPV business for almost a decade and predicted the rise of this new generation of BIPV. In n-tech’s latest report on BIPV we examine the current prospects for BIPV and the trials it must still face on the way to commercialization. This report:

- Provides ten-year forecasts of BIPV shipments and revenues with breakouts by product type (tiles, windows, etc.), type of building (commercial, residential, etc.) and technology (c-Si, OPV, etc.) and key geographies
- Identifies winning strategies in the BIPV business including both product/marketing and supply chain evolution. The discussion includes the BIPV-related activities of glass, specialty chemical and solar panel firms
- Examines the technology that is likely to power next-generation BIPV, especially whether OPV, DSC and CIGS will ever keep their promise to succeed as part of a BIPV boom.
- Considers the opportunities for BIPV businesses to make money through integration of their products with smart lighting and smart windows as well through the strategic use of battery storage.
- Addresses the BIPV market on an international basis with consideration for the special subsidies and economic factors that are promoting BIPV.

n-tech Research believes that this report will be a must-read for marketing, business development, and product management executives in the following sectors:

- Solar panels and specialty BIPV
- Roofing and walling products
- Flat glass products and windows
- Specialty chemicals and smart materials
- Construction and architecture
- Energy management

Table of Contents

Executive Summary

E.1 BIPV: State of a Market

E.1.1 Commercial Buildings and Government Buildings

E.1.2 Residential Buildings

E.2 Subsidy Concerns: Why this is an Opportunity for BIPV

E.3 What the Failure of Dow’s BIPV Product Teaches Us

E.4 The Significance of the Tesla—Solar City initiative

E.5 The BIPV Supply Structure: Who are the BIPV Firms and What do they Sell?

E.5.1 Influential Firms in the BIPV Business

E.5.2 Opportunities for Glass Firms

E.6 BIPV Supply Chains and Logistics

E.6.1 Logistical Challenges

E.7 Summary of Ten-year BIPV Market Forecasts

Chapter One: Introduction

1.1 Background to this Report

1.1.1 BIPV—A Business Model for Distributed Renewable Power

1.1.2 Resurrecting the BIPV Industry

1.1.3 The Future of BIPV

1.2 Objective and Scope of this Report

1.3 Methodology of this Report: Information Sources

1.4 Plan of this Report

Chapter Two: BIPV: Technology and Product Developments

2.1 The Core Value Propositions of BIPV Technology

2.1.1 Aesthetic Value

2.1.2 Multifunctional Products

2.1.3 Energy Generation at Consumption Point

2.2 Current Economics of BIPV – Ignoring the Multi-Functionality Aspect

2.2.1 Low-cost Distributed Energy: Benefits to User and Power Industry

2.2.2 Aesthetic and other Benefits

2.3 Comparative Analysis of Different BIPV Solutions

2.4 BIPV is still Mostly about Glass

2.4.1 BIPV Glass – Dominating the BIPV Market

2.4.2 Growing Collaborations between Glass and BIPV Companies

2.4.3 Facades and Curtain Walls

2.4.4 Skylights with Photovoltaic Glass Maintain Aesthetics and Generate Power

2.4.5 Windows

2.4.6 Window Shades

2.4.7 BIPV Glass Roof—Solar Tiles for Residential Pitched Roof, Now of Glass—Tesla

2.5 BIPV Roofs

2.5.1 Dow's Exit—a Concern for the BIPV Market

2.5.2 Other Companies—What does the Future hold for Them?

2.5.3 Warranties

2.6 Solar Cell Technologies and their Application in BIPV

2.6.1 Will TFPV, OPV and DSC ever become a Significant Factor in the BIPV Market?

2.7 Transparency and Color Option

2.7.1 Daylighting as a Function of BIPV

2.7.2 Integrating with Smart Windows—Towards Transparent BIPV Windows

2.7.3 Luminescent Solar Concentrators

2.8 Spray-on Solar

2.8.1 R&D in this Area

2.9 BIPV-related Heat Sink Technology

2.9.1 Heat Sink Strategies

2.10 Batteries for BIPV

2.11 Innovations in BIPV Manufacturing and Materials

2.12 Key Points Made in this Chapter

Chapter Three: Commercial and Industrial Building Markets for BIPV: Commercial Real Estate and Public Buildings

- 3.1 Expectations for Worldwide Commercial and Industrial Construction: Impact on BIPV
- 3.2 Special Subsidies and Market Prospects by Country and Region: Market Demands and Government Policies
 - 3.2.1 United States
 - 3.2.2 France
 - 3.2.3 Germany
 - 3.2.4 United Kingdom
 - 3.2.5 Spain
 - 3.2.6 China
 - 3.2.7 Japan
 - 3.2.8 Other Significant Regions and Countries
- 3.3 Ten-year Market Forecasts of BIPV in Commercial and Industrial Buildings
 - 3.3.1 Retrofit and Replacement Patterns for BIPV in Commercial and Industrial Buildings
 - 3.3.1.1 Pricing Assumptions
 - 3.4.2 Forecasts by Country
 - 3.3.3 Forecast by Type of Product
 - 3.3.3.1 Commercial Roofing Forecasts
 - 3.3.3.2 Commercial Walling Forecasts
 - 3.3.3.3 Commercial Glass Forecasts
 - 3.3.4 Forecast by PV Technology
 - 3.3.4.1 Commercial BIPV Forecasts by Technology
- 3.4 Key Points Made in this Chapter

Chapter Four: Residential Markets for BIPV

- 4.1 BIPV and Multi-tenant Buildings
 - 4.2 BIPV and Single-family Dwellings
 - 4.2.1 Companies Offering BIPV Products for the Residential Market
 - 4.3 Market Prospects by Country and Region: Market Demands and Government Policies
 - 4.3.1 United States
 - 4.3.2 France
 - 4.3.3 Germany
 - 4.3.4 United Kingdom
 - 4.3.5 Spain
 - 4.3.6 China
 - 4.3.7 Japan
 - 4.3.8 Other Significant Regions and Countries
 - 4.4 Ten-year Market forecasts of BIPV in commercial and industrial buildings
 - 4.4.1 Forecast by Country
 - 4.4.2 Forecast by Type of Product
 - 4.4.2.1 Residential Roofing Forecasts
 - 4.4.2.2 Residential Walling Forecasts
 - 4.4.2.3 Residential Glass Forecasts
 - 4.4.3 Forecast by PV Technology
 - 4.5 Key Points from this Chapter
- Acronyms and Abbreviations Used In this Report
- About the Authors

List of Exhibits

- Exhibit E-1: BIPV Companies and Their Products
- Exhibit E-2: Companies Key to BIPV Glass Success
- Exhibit E-3: BIPV Interpretations Across the Supply Chain

Exhibit E-4: Total BIPV Commercial Market (MWs)
Exhibit E-5: Total BIPV Commercial Market Revenue (\$ Millions)
Exhibit E-6: Total BIPV Residential Market (MWs)
Exhibit E-7: Total BIPV Residential Market Revenue (\$ Millions)
Exhibit E-8: Total BIPV Commercial and Residential Market (MWs)
Exhibit E-9: Total BIPV Commercial and Residential Market Revenue (\$ Millions)
Exhibit E-10: Total BIPV Commercial and Residential Market by Region (MWs)
Exhibit E-11: Total Commercial and Residential Market by Technology (MWs)
Exhibit E-12: Total Commercial and Residential Market by Technology (\$ Millions)
Exhibit 2-1: Comparison on BIPV Solutions
Exhibit 2-2: BIPV Systems
Exhibit 2-3: Façade Application Methods
Exhibit 2-4: Onyx Commercial Installations
Exhibit 2-5: Semiconductor Technologies for BIPV
Exhibit 2-6: Example of Philips Patents: LSC
Exhibit 3-1: Important Institutions in France that are Engaged with BIPV
Exhibit 3-2: Influential Institutions in Germany that are Engaged with BIPV
Exhibit 3-3: BIPV Retrofit and Replacement Patterns on Commercial Buildings
Exhibit 3-4: Overall PV Shipments and Share of BIPV Products
Exhibit 3-5: Non-Glass BIPV Products Pricing
Exhibit 3-6: Total BIPV Commercial Market (MWs)
Exhibit 3-7: Total BIPV Commercial Market Revenue (\$ Millions)
Exhibit 3-8: Share of BIPV Commercial Market by Region (Percent)
Exhibit 3-9: United States BIPV Commercial Market (MWs)
Exhibit 3-10: Europe BIPV Commercial Market (MWs)
Exhibit 3-11: Japan BIPV Commercial Market (MWs)
Exhibit 3-12: China BIPV Commercial Market (MW)
Exhibit 3-13: ROW BIPV Commercial Market (MW)
Exhibit 3-14: Total BIPV Commercial Market by Region (MW)
Exhibit 3-15: Share of Roofing Products in Overall Roofing Market
Exhibit 3-16: BIPV Commercial Roofing Market
Exhibit 3-17: BIPV Commercial Roofing Overlay Market by Type of PV Technology Used
Exhibit 3-18: BIPV Commercial Roofing Overlay Market Revenue by Type of PV Technology Used (\$Millions)
Exhibit 3-19: Rigid BIPV Commercial Roofing Market by Type of PV Technology Used
Exhibit 3-20: Rigid BIPV Commercial Roofing Market Revenue by Type of PV Technology Used (\$ Millions)
Exhibit 3-21: Flexible BIPV Commercial Roofing Market by Type of PV Technology Used
Exhibit 3-22: Flexible BIPV Commercial Roofing Market Revenue by Type of PV Technology Used (\$ Millions)
Exhibit 3-23: Monolithically Integrated BIPV Commercial Roofing Market by Type of PV Technology Used
Exhibit 3-24: Monolithically Integrated BIPV Commercial Roofing Market Revenue by Type of PV Technology Used (\$ Millions)
Exhibit 3-25: Total Commercial Roofing Market Revenue by Product Types (\$ Millions)
Exhibit 3-26: Share of Entire BIPV Walling Market
Exhibit 3-27: Commercial BIPV Walling Market
Exhibit 3-28: Commercial WAPV Material Shipments by Type of PV Technology Used
Exhibit 3-29: Commercial WAPV Material Shipments by Type of PV Technology Used (\$ Millions)
Exhibit 3-30: Commercial Repurposed BIPV Roofing Material Shipments by Type of PV Technology Used
Exhibit 3-31: Commercial Repurposed BIPV Roofing Material Shipments by Type of PV Technology Used (\$ Millions)
Exhibit 3-32: Commercial BIPV Siding By Type of PV Technology Used
Exhibit 3-33: Commercial BIPV Siding By Type of PV Technology Used (\$ Millions)
Exhibit 3-34: Total Commercial Walling Market Revenue by Product Types (\$ Millions)
Exhibit 3-35: Share of BIPV Glass Products in Overall Glass Market
Exhibit 3-36: Share of BIPV Commercial Glass Market

Exhibit 3-37: Commercial BIPV Façade & Curtain Wall Glass Market by Type of PV Technology Used

Exhibit 3-38: Commercial BIPV Façade & Curtain Wall Market Revenue by Type of PV Technology Used (\$ Millions)

Exhibit 3-39: Commercial BIPV Skylight Glass Market by Type of PV Technology Used

Exhibit 3-40: Commercial BIPV Skylight Market Revenue by Type of PV Technology Used (\$ Millions)

Exhibit 3-41: Commercial BIPV Windows Market by Type of PV Technology Used

Exhibit 3-42: Commercial BIPV Windows Market Revenue by Type of PV Technology Used (\$ Millions)

Exhibit 3-43: Commercial BIPV Window Shades Market by Type of PV Technology Used

Exhibit 3-44: Commercial BIPV Window Shades Market Revenue by Type of PV Technology Used (\$ Millions)

Exhibit 3-45: Total Commercial BIPV Glass Market Revenue by Product Types (\$ Millions)

Exhibit 3-46: Total Commercial Roofing Market by Technology (MWs)

Exhibit 3-47: Total Commercial Roofing Market Revenue by Technology (\$ Millions)

Exhibit 3-48: Total Commercial Walling Market by Technology (MWs)

Exhibit 3-49: Total Commercial Walling Market Revenue by Technology (\$ Millions)

Exhibit 3-50: Total Commercial Glass Market by Technology (MWs)

Exhibit 3-51: Total Commercial Glass Market Revenue by Technology (\$ Millions)

Exhibit 3-52: Total Commercial BIPV Market by Technology (MWs)

Exhibit 3-53: Total Commercial BIPV Market Revenue by Technology (\$ Millions)

Exhibit 4-1: Examples of Type BIPV Products for the Residential Market

Exhibit 4-2: Tariff Rates for BIPV Installations In Different States

Exhibit 4-3: FiTs in France

Exhibit 4-4: Spanish PV FiTs

Exhibit 4-5: Chinese PV FiTs

Exhibit 4-6: Total BIPV Residential Market (MWs)

Exhibit 4-7: Total BIPV Residential Market Revenue (\$ Millions)

Exhibit 4-8: Share of BIPV Residential Market by Region (Percent)

Exhibit 4-9: United States BIPV Residential Market (MWs)

Exhibit 4-10: Europe BIPV Residential Market (MW)

Exhibit 4-11: Japan BIPV Residential Market (MW)

Exhibit 4-12: China BIPV Residential Market (MW)

Exhibit 4-13: ROW BIPV Residential Market (MW)

Exhibit 4-14: Total BIPV Residential Market by Region (MW)

Exhibit 4-15: BIPV Residential Roofing Market

Exhibit 4-16: BIPV Residential Roofing Overlay Market by Type of PV Technology Used

Exhibit 4-17: BIPV Residential Roofing Overlay Market Revenue by Type of PV Technology Used (\$ Millions)

Exhibit 4-18: Rigid BIPV Residential Roofing Market by Type of PV Technology Used

Exhibit 4-19: Rigid BIPV Residential Roofing Market Revenue by Type of PV Technology Used (\$ Millions)

Exhibit 4-20: Flexible BIPV Residential Roofing Market by Type of PV Technology Used

Exhibit 4-21: Flexible BIPV Residential Roofing Market Revenue by Type of PV Technology Used (\$ Millions)

Exhibit 4-22: Monolithically Integrated BIPV Residential Roofing Market by Type of PV Technology Used

Exhibit 4-23: Monolithically Integrated BIPV Residential Roofing Market Revenue by Type of PV Technology Used (\$ Millions)

Exhibit 4-24: Total Residential Roofing Market Revenue by Product Types (\$ Millions)

Exhibit 4-25: Residential BIPV Walling Market

Exhibit 4-26: Residential WAPV Material Shipments by Type of PV Technology Used

Exhibit 4-27: Residential WAPV Material Shipments by Type of PV Technology Used (\$ Millions)

Exhibit 4-28: Total Residential Walling Market Revenue by Product Type (\$ Millions)

Exhibit 4-29: Total BIPV Commercial and Residential Walling Market Revenue by Product Types (\$ Million)

Exhibit 4-30: BIPV Residential Glass Market

Exhibit 4-31: Residential BIPV Façade & Curtain Wall Glass Market by Type of PV Technology Used

Exhibit 4-32: Residential BIPV Façade & Curtain Wall Market Revenue by Type of PV Technology Used (\$ Millions)

Exhibit 4-33: Residential BIPV Skylight Glass Market by Type of PV Technology Used

Exhibit 4-34: Residential BIPV Skylight Market Revenue by Type of PV Technology Used (\$ Millions)

Exhibit 4-35: Residential BIPV Windows Market by Type of PV Technology Used

Exhibit 4-36: Residential BIPV Windows Market Revenue by Type of PV Technology Used (\$ Millions)
Exhibit 4-37: Residential BIPV Window Shades Market by Type of PV Technology Used
Exhibit 4-38: Residential BIPV Window Shades Market Revenue by Type of PV Technology Used (\$ Millions)
Exhibit 4-39: Total Residential BIPV Glass Market Revenue by Product Types (\$ Millions)
Exhibit 4-40: Total Commercial & Residential BIPV Glass Market Revenue (\$ Millions)
Exhibit 4-41: Total Residential Roofing Market by Technology (MWs)
Exhibit 4-42: Total Residential Roofing Market Revenue by Technology (\$ Millions)
Exhibit 4-43: Total Residential Walling Market by Technology (MWs)
Exhibit 4-44: Total Residential Walling Market Revenue by Technology (\$ Million)
Exhibit 4-45: Total Residential Glass Market by Technology (MWs)
Exhibit 4-46: Total Residential Glass Market Revenue by Technology (\$ Millions)
Exhibit 4-47: Total Residential BIPV Market by Technology (MWs)
Exhibit 4-48: Total Residential BIPV Market Revenue by Technology (\$ Millions)

More information here: http://ntechresearch.com/market_reports/bipv-technologies-and-markets-2017-2024



Interactive Order Form

Email to sales@ntechresearch.com or fax to 804-360-7259

Report #	Title	Price
TOTAL		

Bill to:

Name _____
Organization _____
Address 1 _____
Address 2 _____
City _____
State _____
Zip/Postal Code _____
Country _____
Phone _____
E-Mail _____
Report Delivery E-Mail _____

Payment Information:

Visa Master Card American Express

Credit Card # _____
Expiration Code _____ \ _____
CVV Security Code _____
Purchase Order # _____
Cardholder's Signature _____

Refunds, Exchanges and Cancellation

Given the highly consumable nature of our information products NanoMarkets does not provide refunds or exchanges once the purchased product has been received by the customer. Once a report has been accepted and read the value of the product has been realized.

NanoMarkets will accept cancellation of an order provided the customer has not accepted delivery of the product either via electronic or shipment by courier.

[Visit our web site to read our complete Terms of Service.](#)