

26 October 2015

OFF-GRID SOLAR LIGHTING MARKET TRENDS

4th International Off-Grid
Lighting Conference

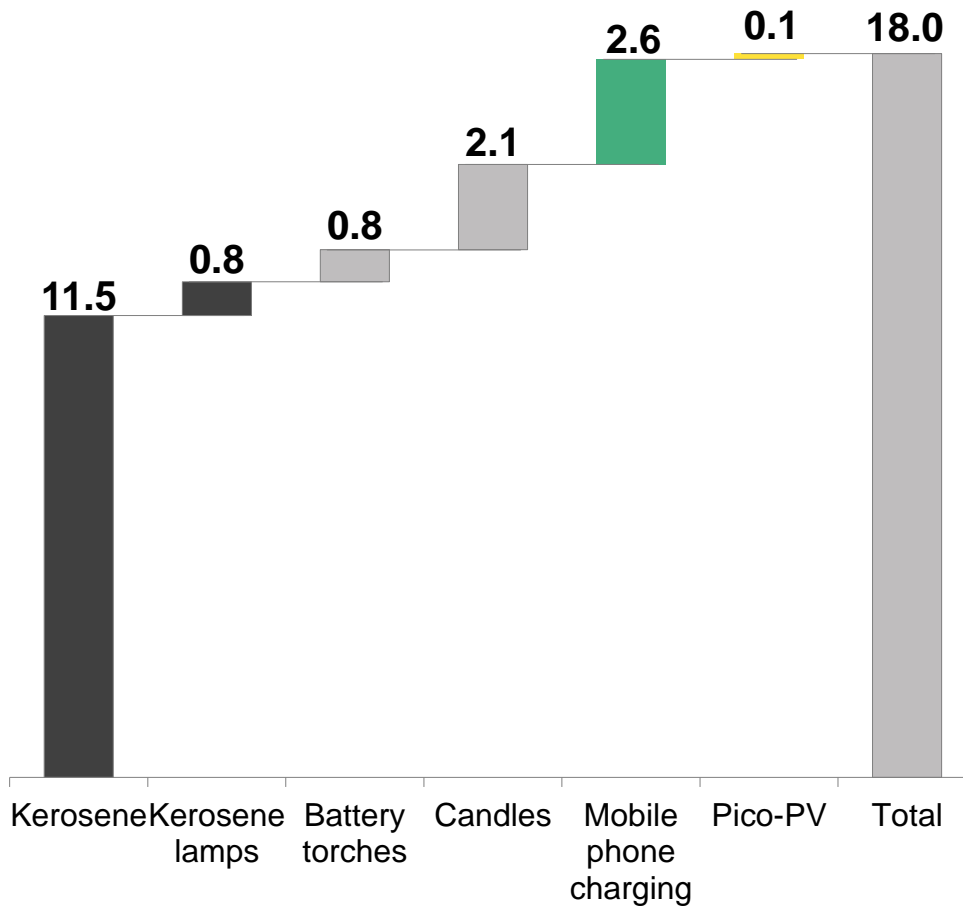


This publication is the copyright of Bloomberg New Energy Finance. No portion of this document may be photocopied, reproduced, scanned into an electronic system or transmitted, forwarded or distributed in any way without prior consent of Bloomberg New Energy Finance.

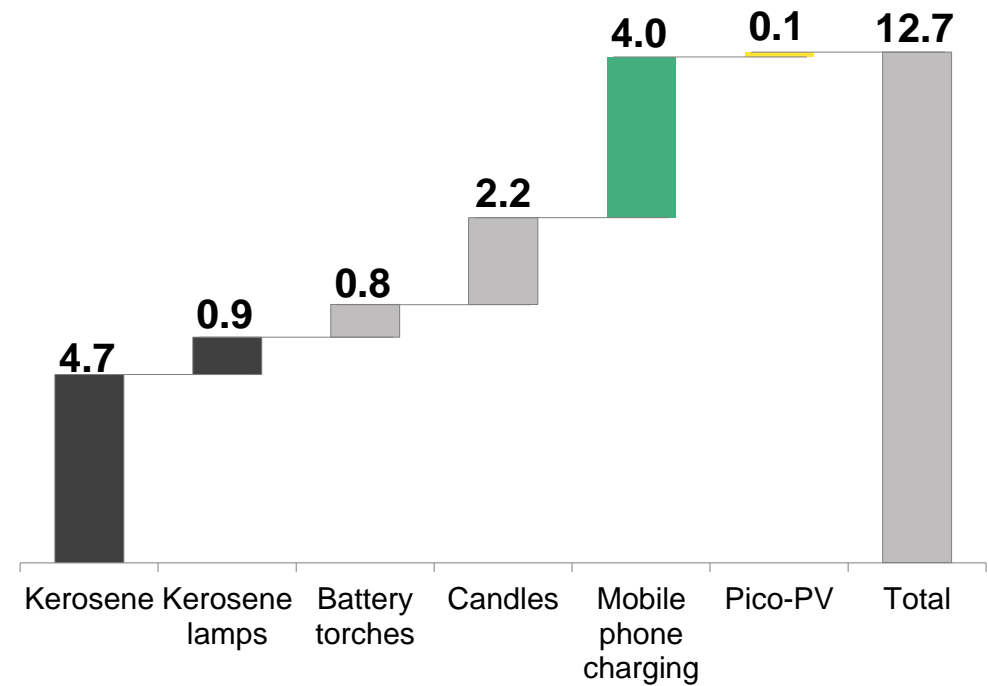
The information contained in this publication is derived from carefully selected sources we believe are reasonable. We do not guarantee its accuracy or completeness and nothing in this document shall be construed to be a representation of such a guarantee. Any opinions expressed reflect the current judgment of the author of the relevant article or features, and does not necessarily reflect the opinion of Bloomberg New Energy Finance, Bloomberg Finance L.P., Bloomberg L.P. or any of their affiliates ("Bloomberg"). The opinions presented are subject to change without notice. Bloomberg accepts no responsibility for any liability arising from use of this document or its contents. Nothing herein shall constitute or be construed as an offering of financial instruments, or as investment advice or recommendations by Bloomberg of an investment strategy or whether or not to "buy," "sell" or "hold" an investment.

ESTIMATED ANNUAL SPEND ON OFF-GRID LIGHTING AND PHONE CHARGING (2014, USD BN)

AFRICA



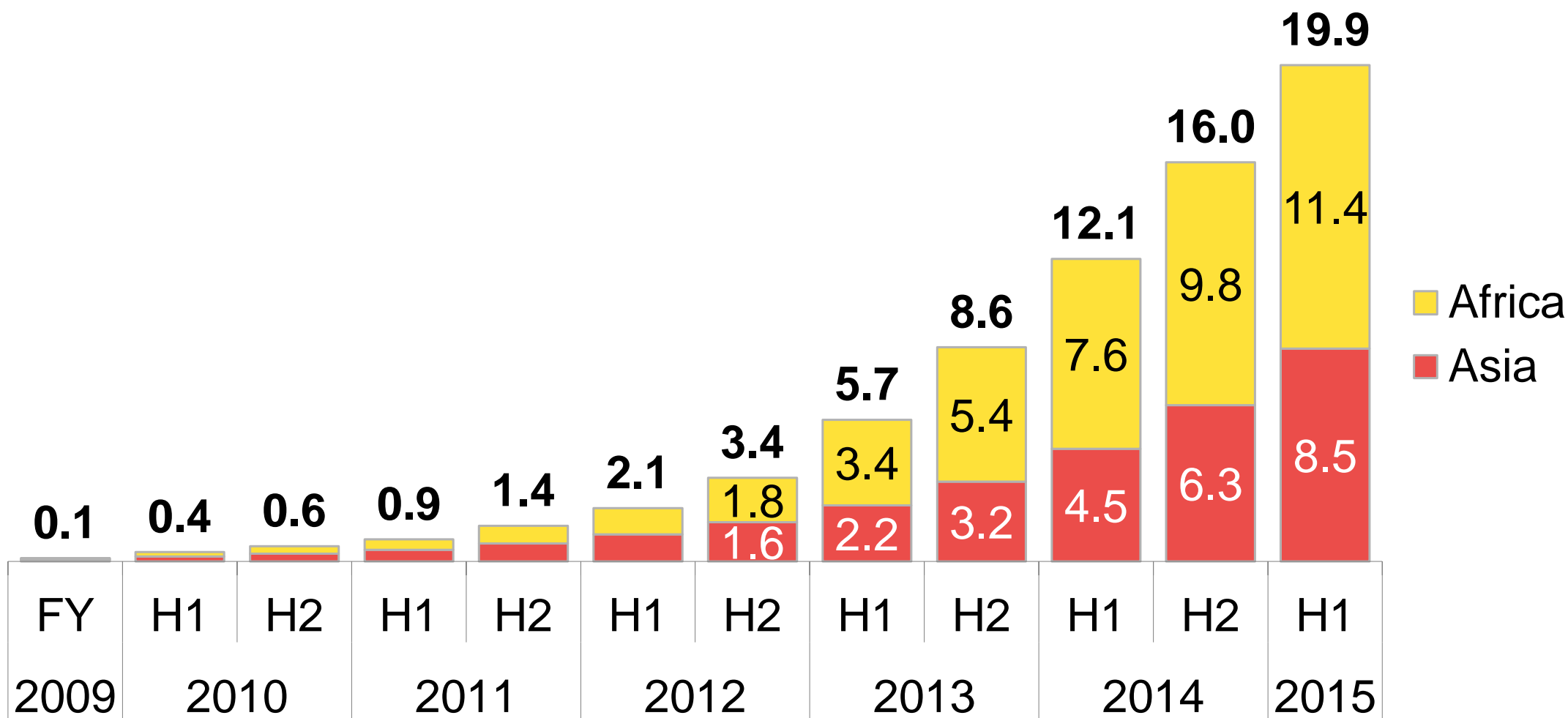
ASIA



Note: mobile phone charging assumption: one weekly charge at \$0.20. Technology breakdown is based on UNEP estimates for 2010. Solar lighting expenditure refers to Lighting Global quality-verified products only.

Source: Bloomberg New Energy Finance, UNEP

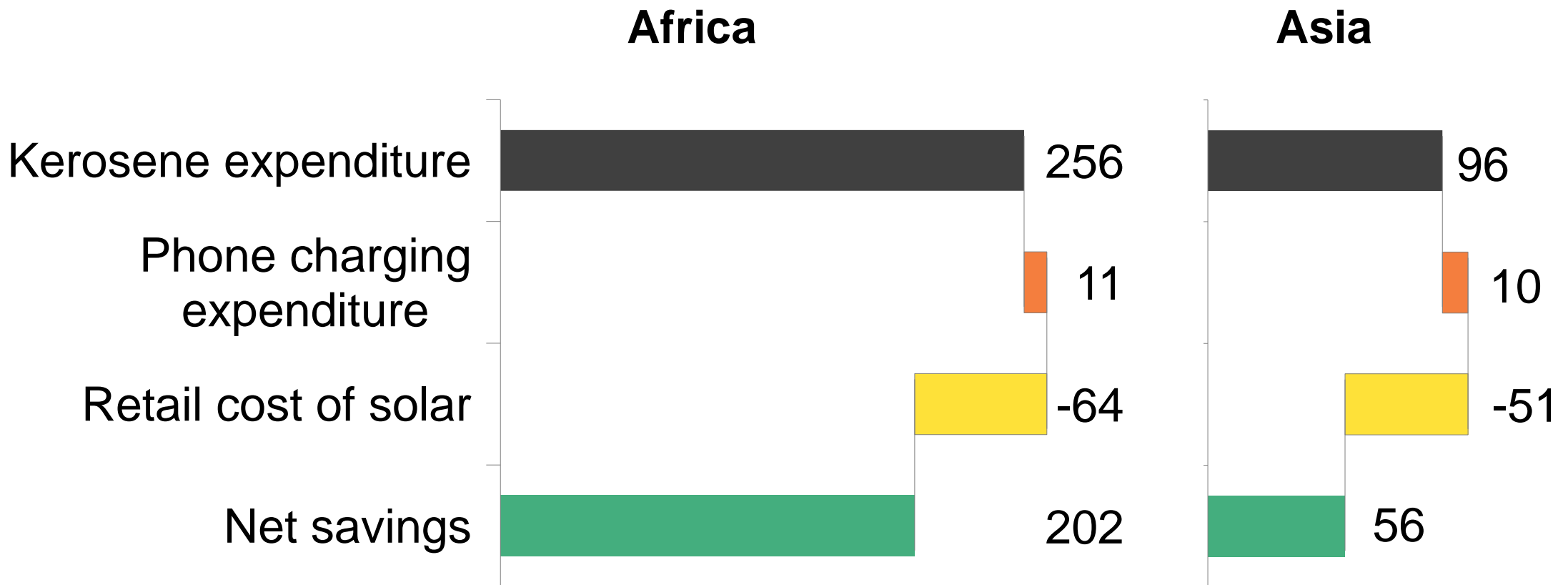
ESTIMATED SALES OF BRANDED PICO SOLAR LIGHTS (MILLIONS OF UNITS, CUMULATIVE)



Note: Data is based on sales data of Lighting Global quality verified product, conversations with and announcements of other market players and BNEF estimates for reporting gaps.

Source: Lighting Global, Bloomberg New Energy Finance

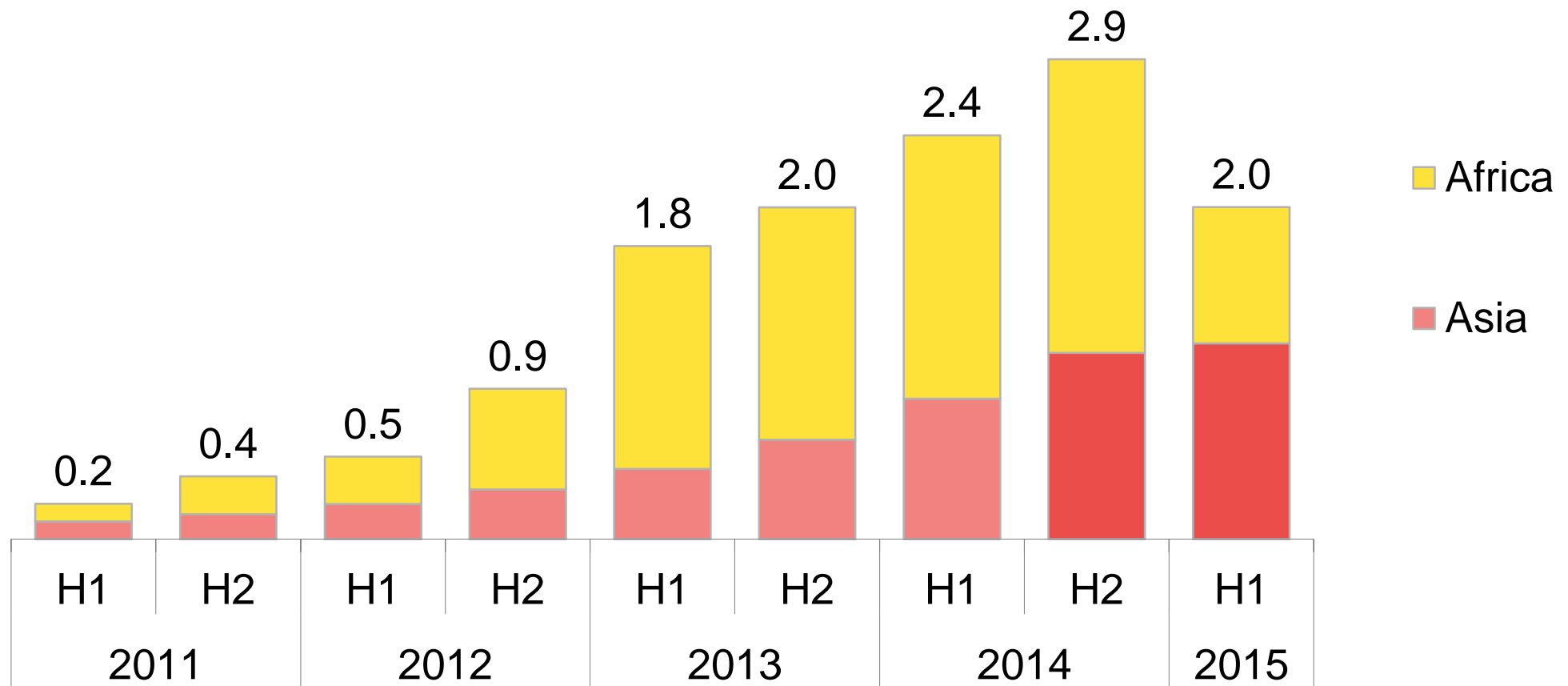
ESTIMATED SAVINGS FROM QUALITY-VERIFIED PICO-PV SYSTEMS SOLD BETWEEN JULY 2014 – JUNE 2015 (USD M)



Note: The figures represent GOGLA social impact tracking metric 5b. Assumes single solar light systems replace one kerosene light and SHS replace two kerosene lanterns with running costs between \$11-40/light, depending on the country and kerosene subsidies. Assumes mobile phone charging costs of \$0.20 and one charge per week per household. Solar product lifetime = 1.5 times warranty period. Refers to sales of Lighting Global quality-verified products only.

Source: Bloomberg New Energy Finance, LightingGlobal, GOGLA, UNEP

SALES OF LIGHTING GLOBAL QUALITY-VERIFIED SOLAR LIGHTS (MILLIONS OF UNITS)



Note: Lightly coloured figures are estimates.

Source: Lighting Global, Bloomberg New Energy Finance

Hypothesis 1: Data limitations

- Not all companies report all the time
- The market can be cyclical and one period not representative

Hypothesis 1: Data limitations

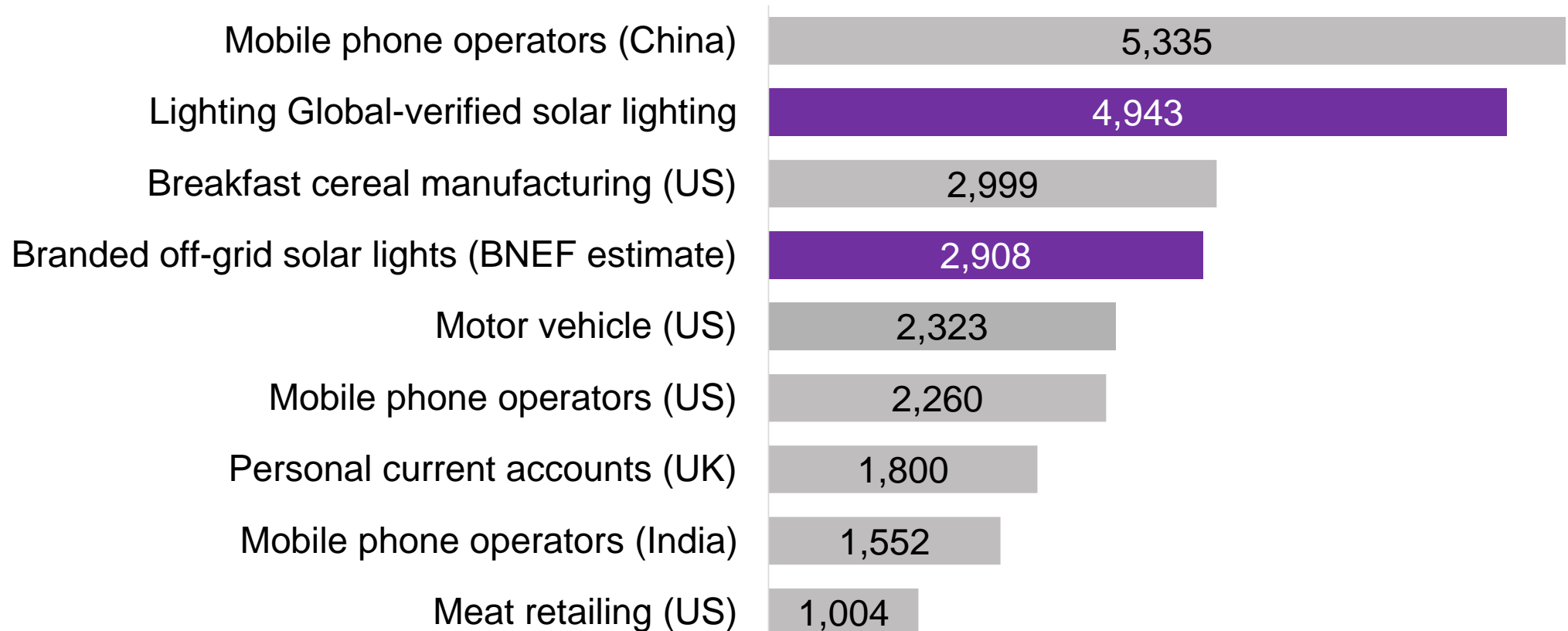
- Not all companies report all the time
- The market can be cyclical and one period not representative

Hypothesis 2: Structural challenges

- Inventory financing constraints
- Correlation with interventions
- Dependence on a small number of large players

PICO-PV MARKET CONCENTRATION BY SOLAR LIGHTING SEGMENT (HERFINDAHL HIRSCHMAN INDEX)

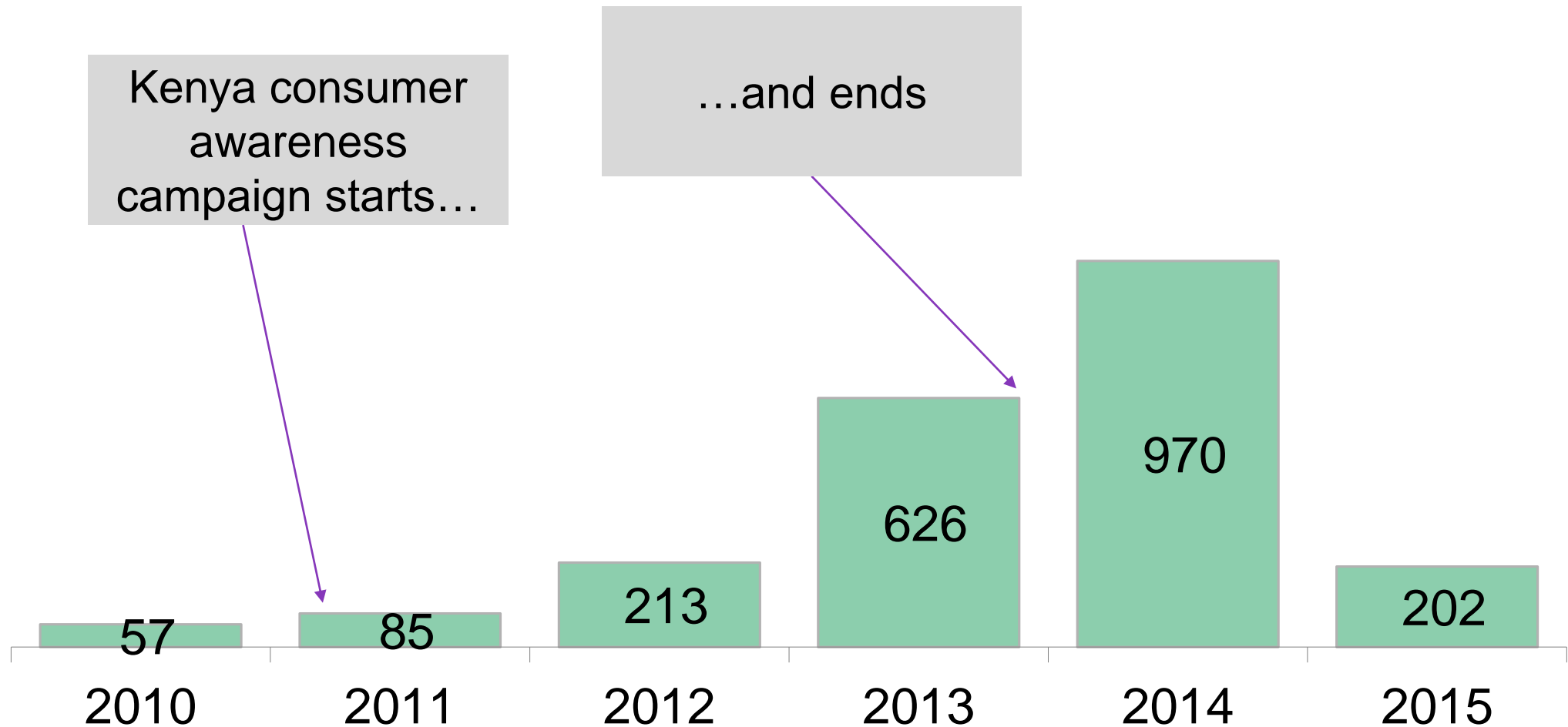
Uncompetitive markets



Note: HHI = Herfindahl-Hirschman Index, a measure of market concentration. The US Department of Justice uses the HHI to assess mergers and considers any value above 1000 to represent either a moderately or highly concentrated market. HHI estimates for off-grid solar refer to cumulative historical market size over 2009 - H1 2015.

Source: Bloomberg New Energy Finance, Lighting Global, US Census data, Ofcom

KENYA: LIGHTING AFRICA INTERVENTIONS AND SALES OF LIGHTING GLOBAL QUALITY-VERIFIED SOLAR LIGHTS (THOUSAND UNITS)



Source: Lighting Global

Hypothesis 1: Data limitations

- Not all companies report all the time
- The market can be cyclical and one period not representative

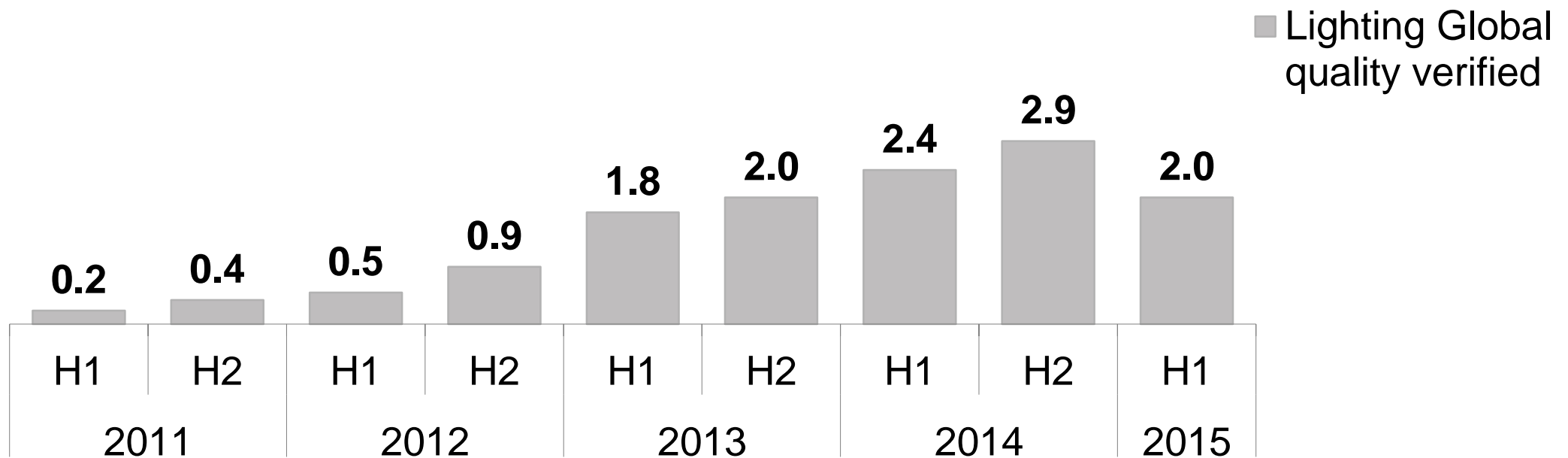
Hypothesis 2: Structural challenges

- Inventory financing constraints
- Correlation with interventions
- Dependence on a small number of large players

Hypothesis 3: Market broadening

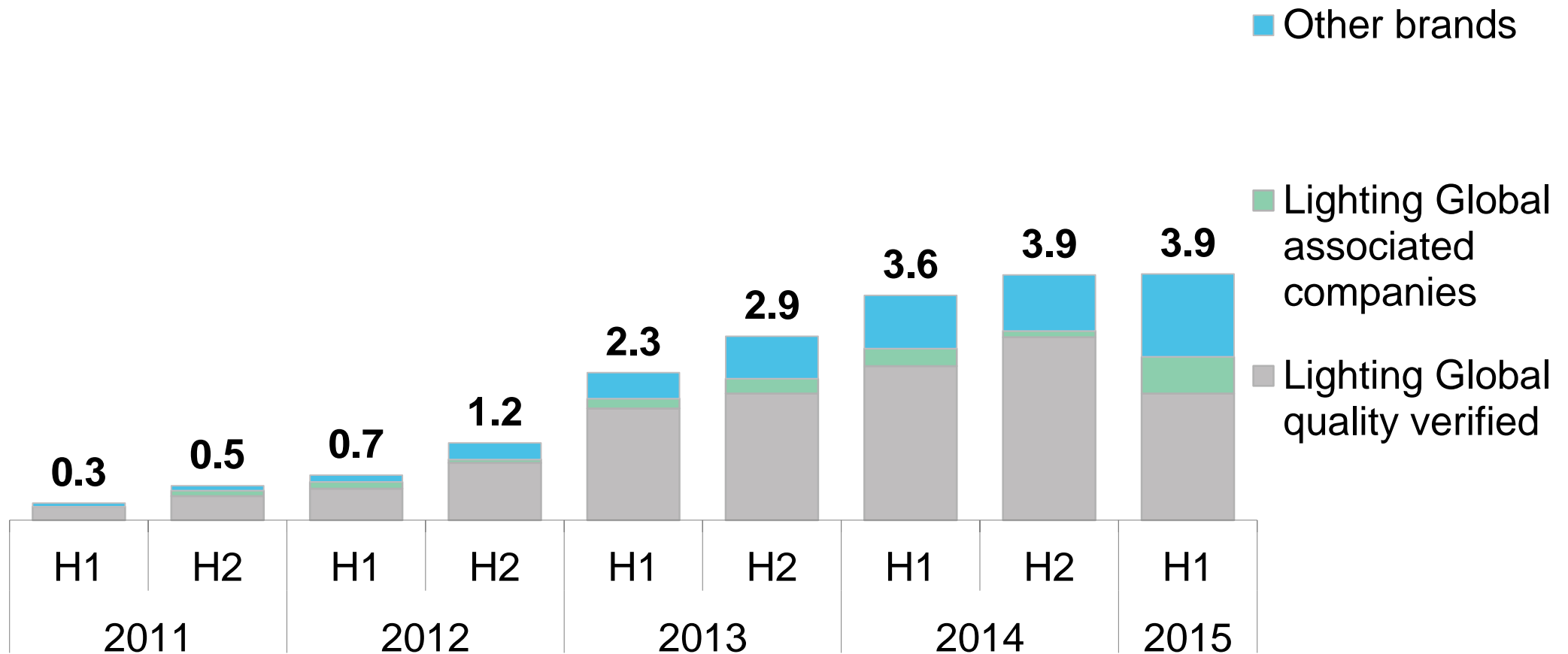
- Have the pioneers succeeded in catalyzing the first markets?

ESTIMATED LIGHTING GLOBAL QUALITY-VERIFIED PICO SOLAR LIGHTING SALES, AFRICA AND ASIA (MILLIONS OF UNITS)



Source: Lighting Global, Bloomberg New Energy Finance

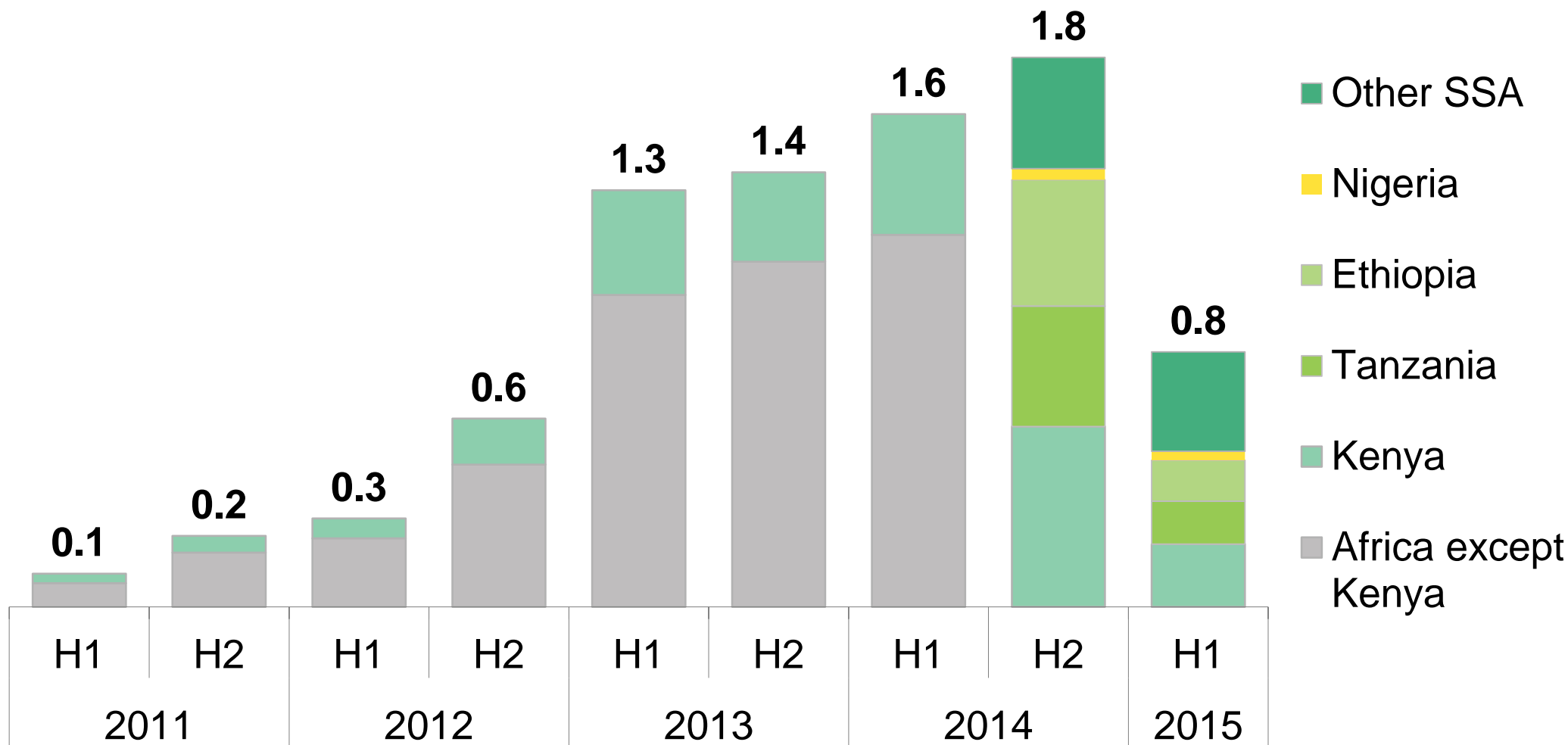
ESTIMATED BRANDED PICO SOLAR LIGHTING SALES, AFRICA AND ASIA (MILLIONS OF UNITS)



Note: Data for Lighting Global associates and other brands represents BNEF estimates based on interviews and other reported figures.

Source: Lighting Global, Bloomberg New Energy Finance

LIGHTING GLOBAL QUALITY VERIFIED PICO PV SALES, AFRICA ONLY (MILLIONS OF UNITS)



Note: Data for Lighting Global associates and other brands represents BNEF estimates based on interviews and other reported figures.

Source: Lighting Global, Bloomberg New Energy Finance



Posted on 22 September 2015

Tanzania and the price of success

“Increased competition in frontier markets brings with it many benefits for the consumer; it keeps prices low; ensures a variety of choice; increases availability and builds awareness. [...]

This **huge surge in competition** has meant SunnyMoney themselves are **under threat** and have needed to quickly reassess its role in this **hugely vibrant market.**”

Source: <http://www.solar-aid.org/tanzania-and-the-price-of-success/> . Emphasis added.



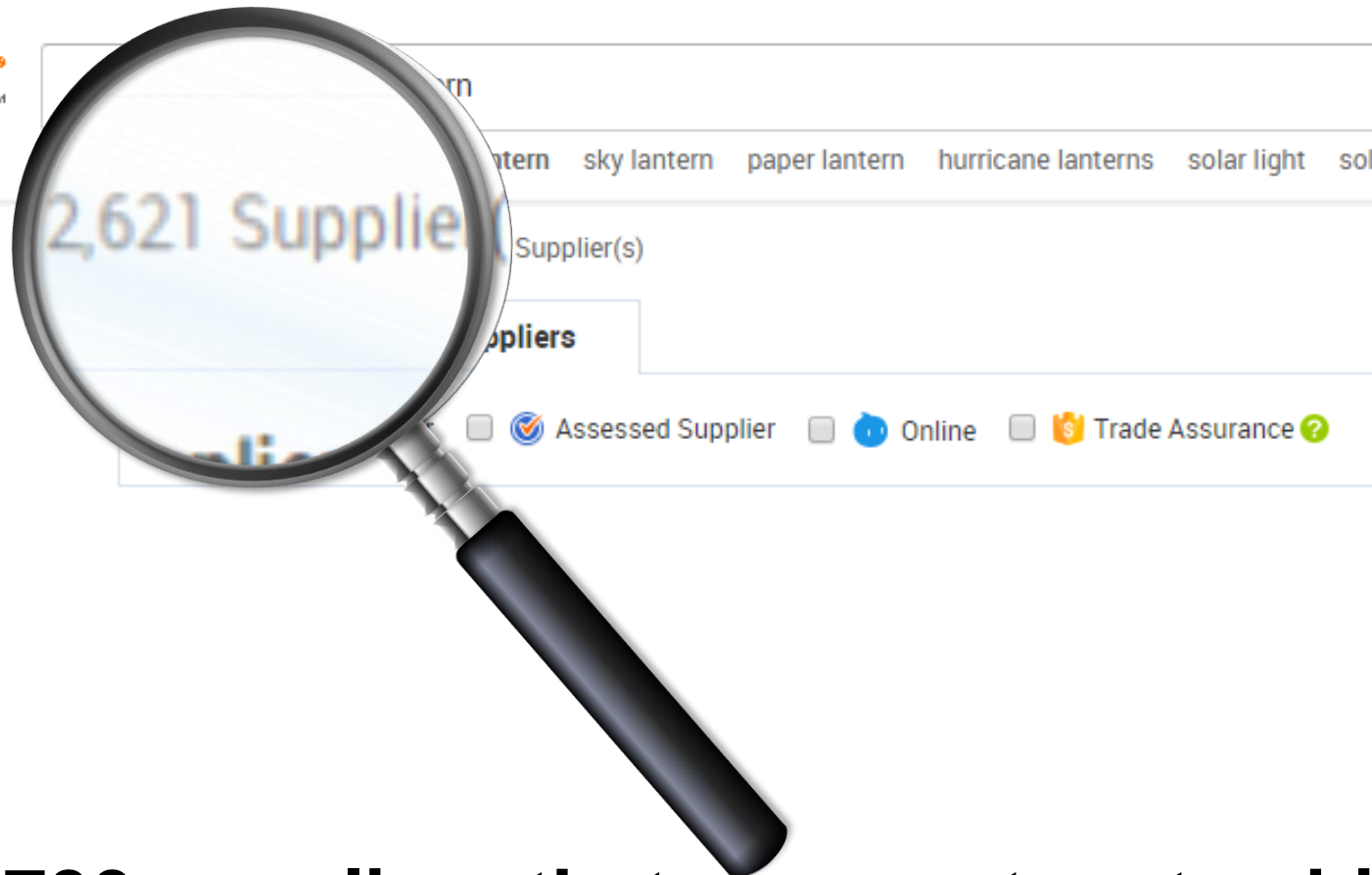
Categories

Lights & Lighting

Camping Lights (306)

Lanterns (213)

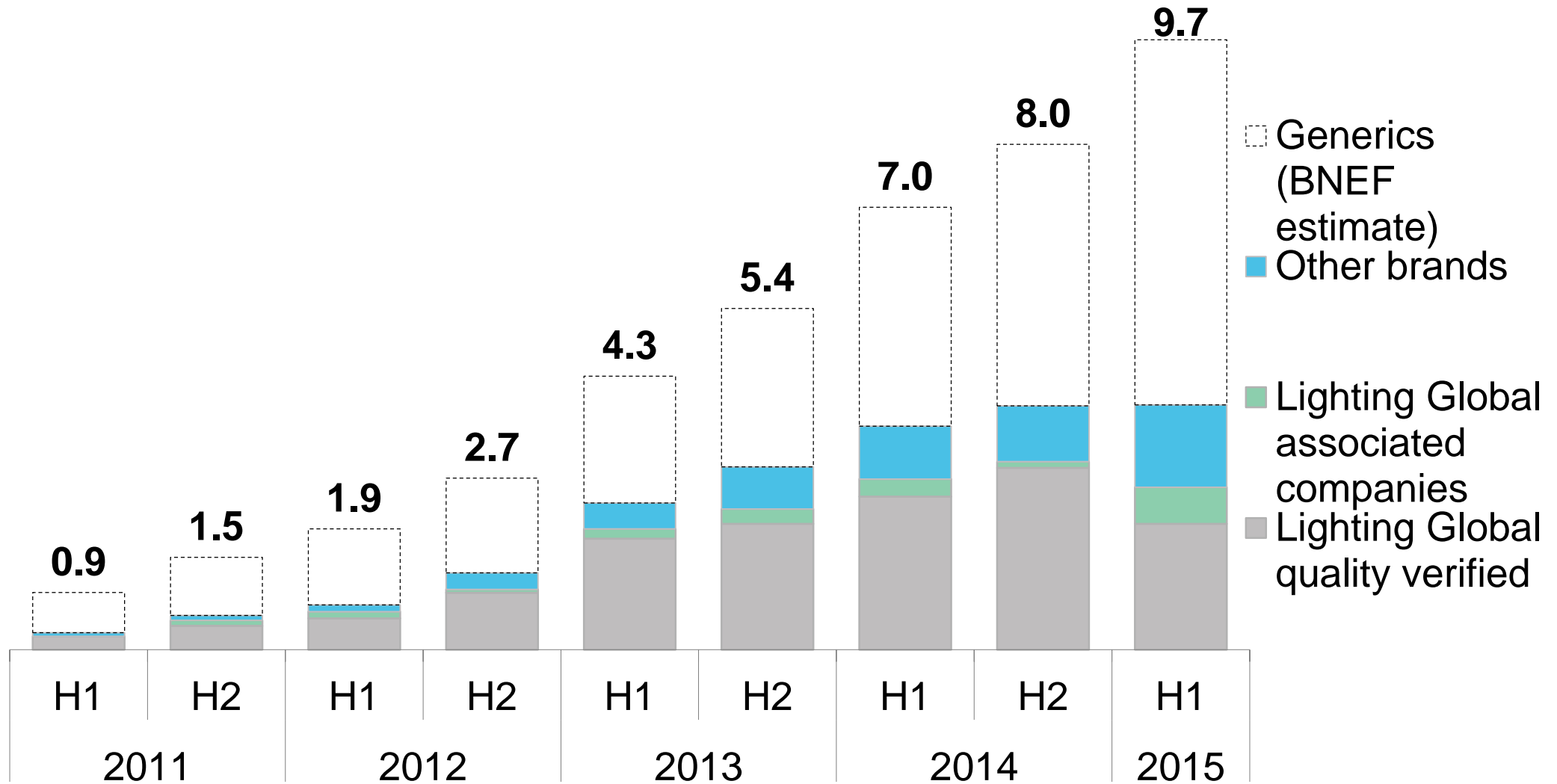
Emergency Lights (69)



**600-700 suppliers that seem set up to ship
off-grid solar lighting kits readily**

Source: Bloomberg New Energy Finance,
Alibaba.com

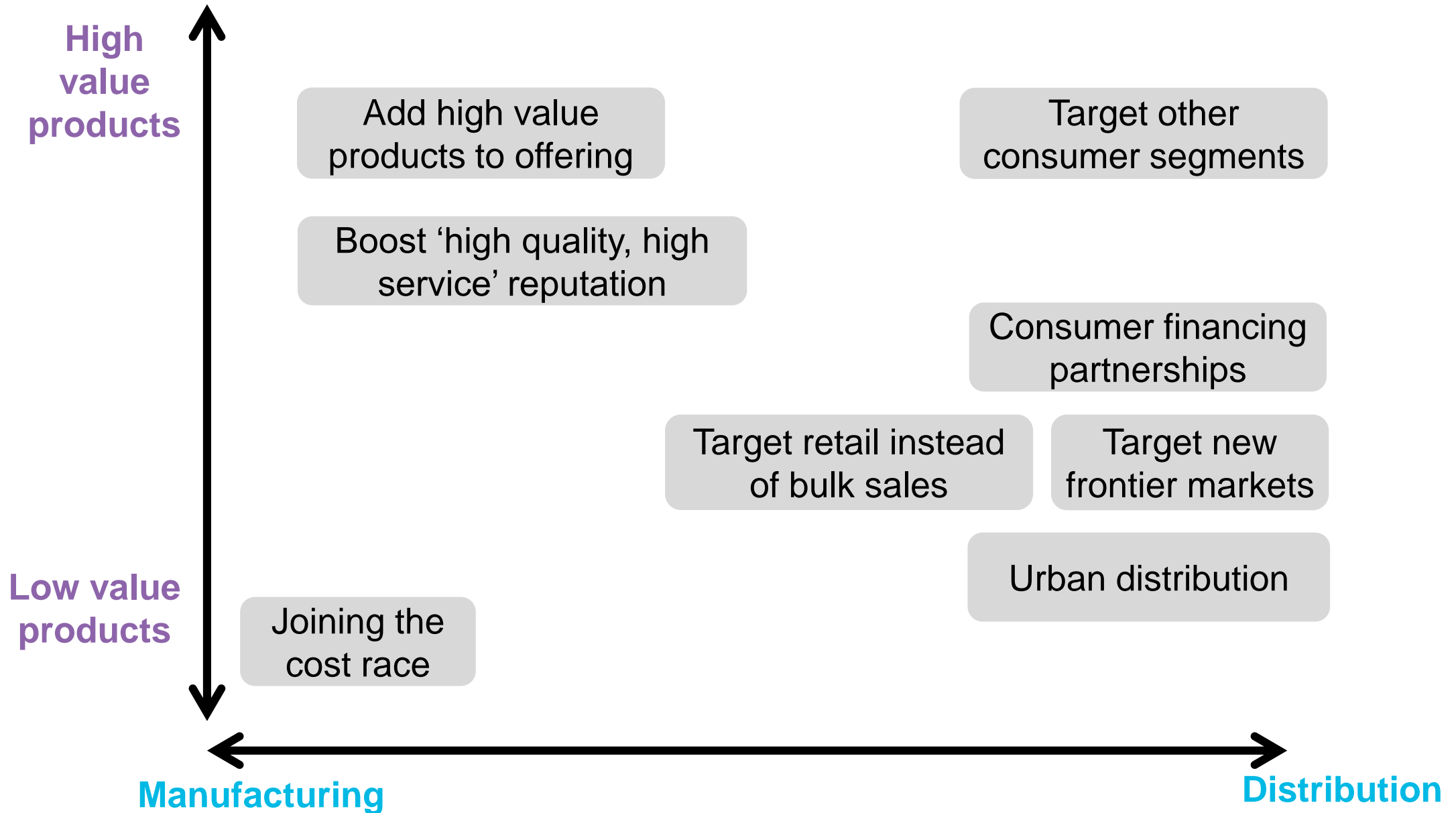
ESTIMATED TOTAL PICO SOLAR LIGHTING SALES, AFRICA AND ASIA (MILLIONS OF UNITS)



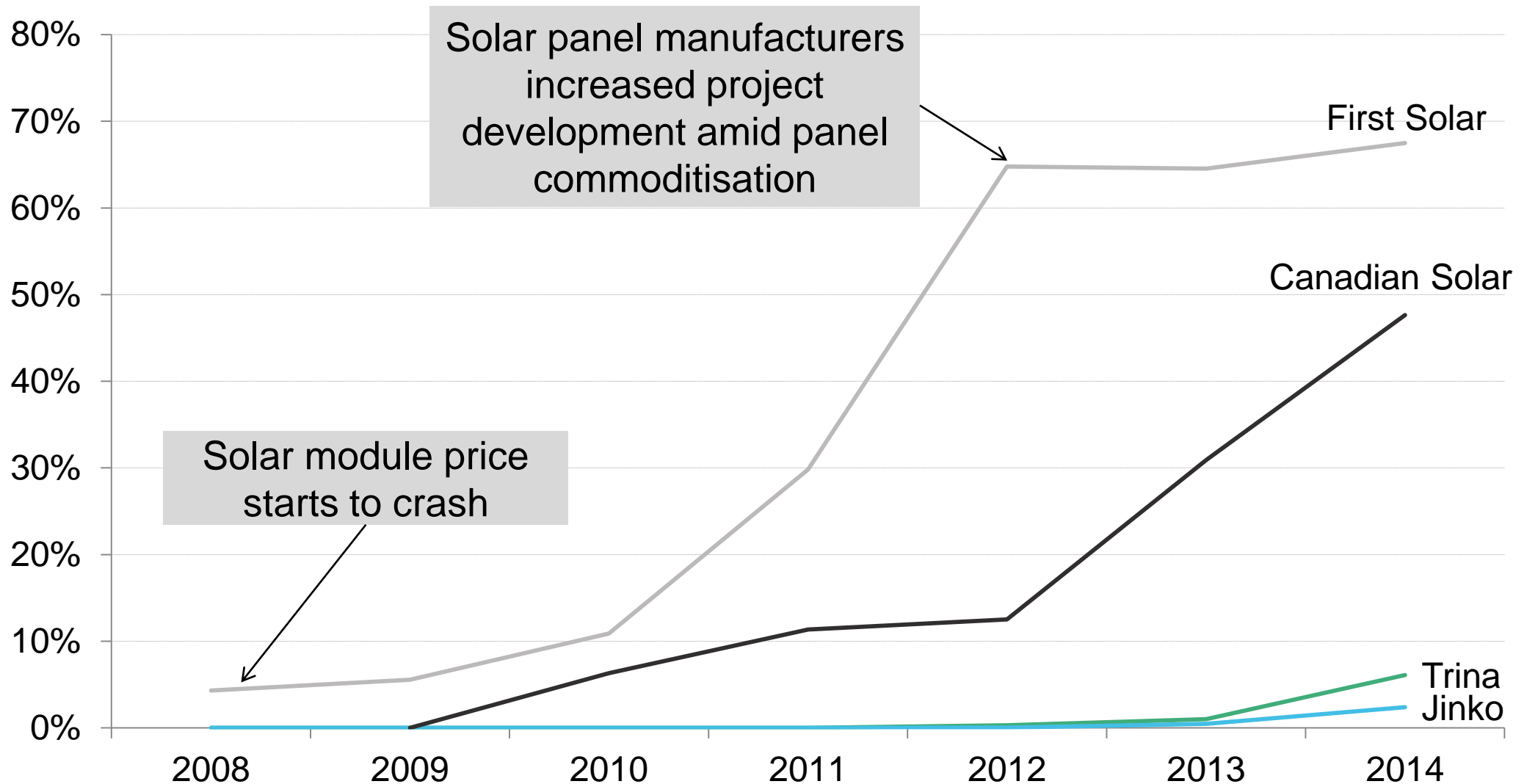
Note: Data for Lighting Global associates and other brands represents BNEF estimates based on interviews and other reported figures.

Source: Lighting Global, Bloomberg New Energy Finance

LANTERN COMPANY REACTIONS TO MARKET SEGMENTATION



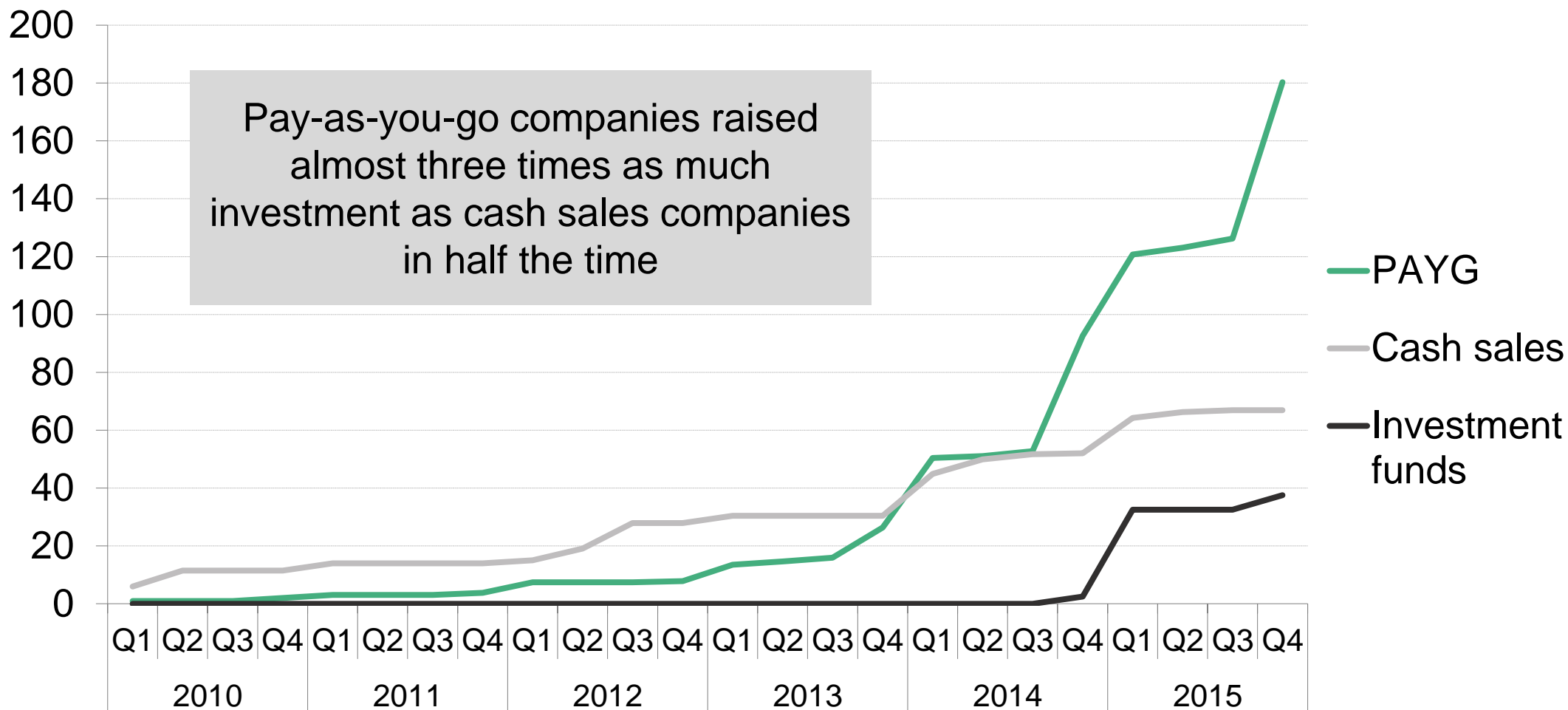
PROPORTION OF SELECTED MODULE MAKERS' REVENUE DERIVED FROM DOWNSTREAM OPERATIONS, 2008-2014



Note: Module makers selected as those with continuous segment reporting over the period. 'Downstream' defined as project development, installation, systems, or O&M – as opposed to direct sale of solar cells and modules.

Source: Bloomberg New Energy Finance

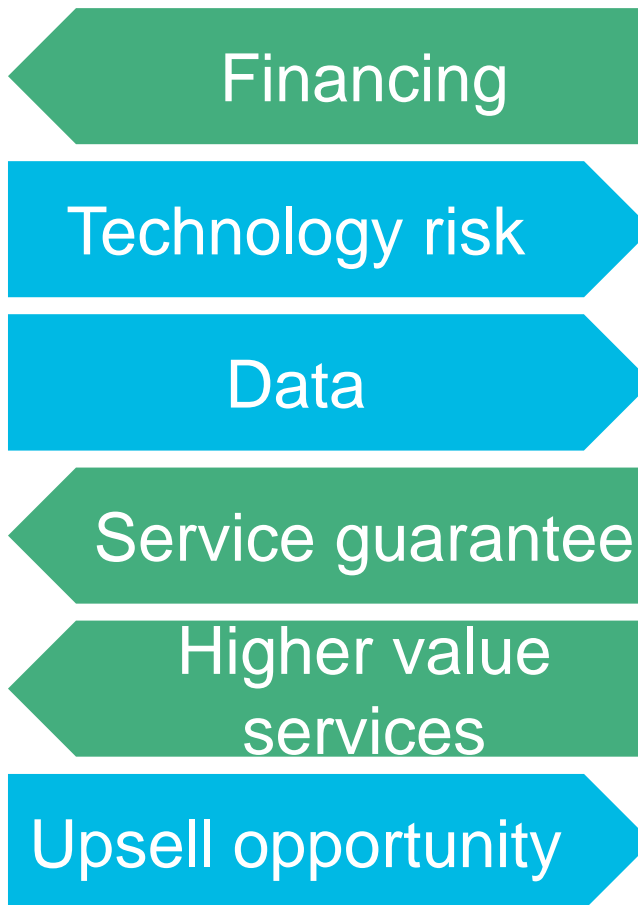
TRACKED INVESTMENTS IN OFF-GRID SOLAR BY RECIPIENT TYPE (USD M CUMULATIVE)



Note: shown data excludes USD 40m of investments with undisclosed date and \$27m of aggregate data for which the recipient type could not be determined.

Source: Bloomberg New Energy Finance

THE SHIFT TO PAYG CHANGES THE DYNAMICS BETWEEN THE CUSTOMER AND THE PROVIDER



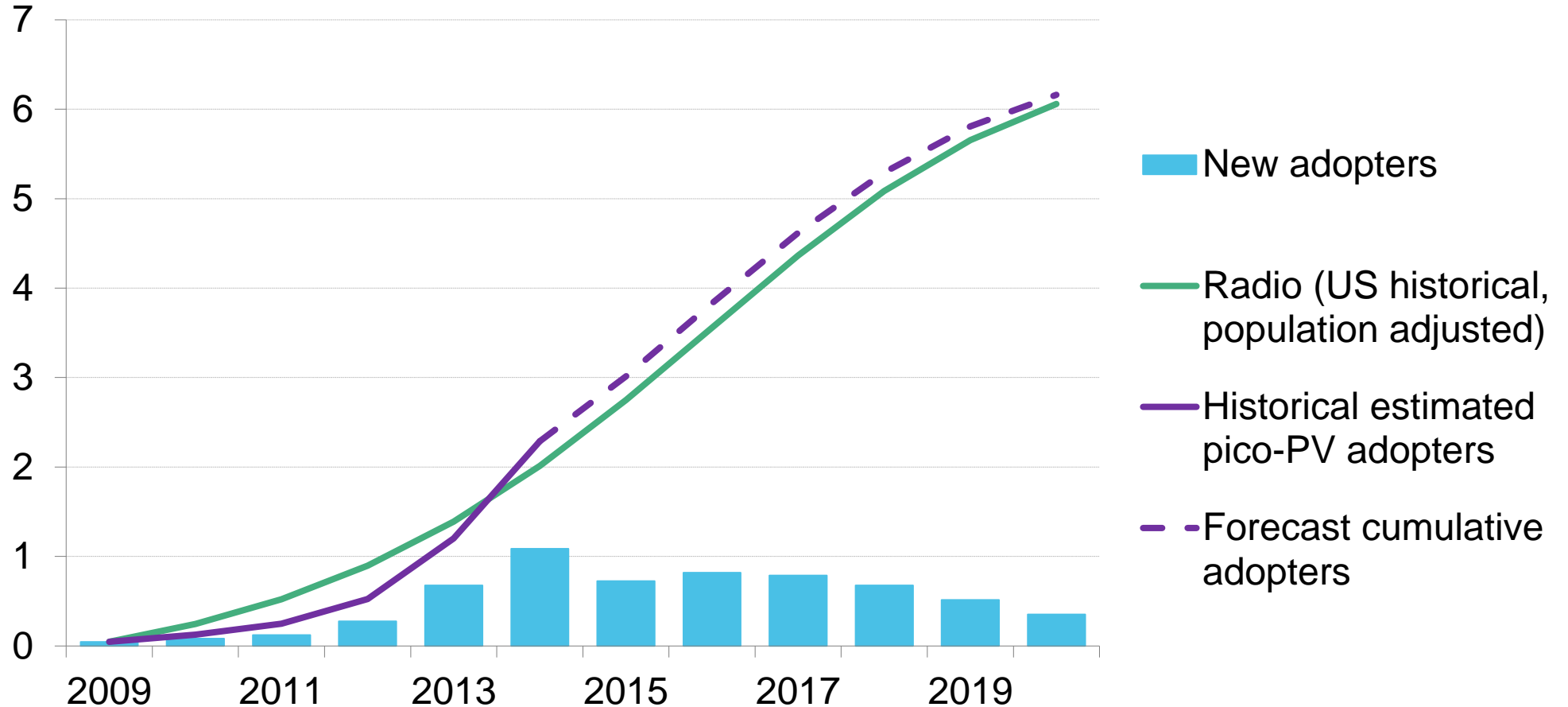
Stronger relationships between customer and provider

Note: The list of companies represents a sample and does not claim to be comprehensive.

Source: Bloomberg New Energy Finance

OFF-GRID SOLAR ADOPTION, KENYA

Households (million, cumulative)

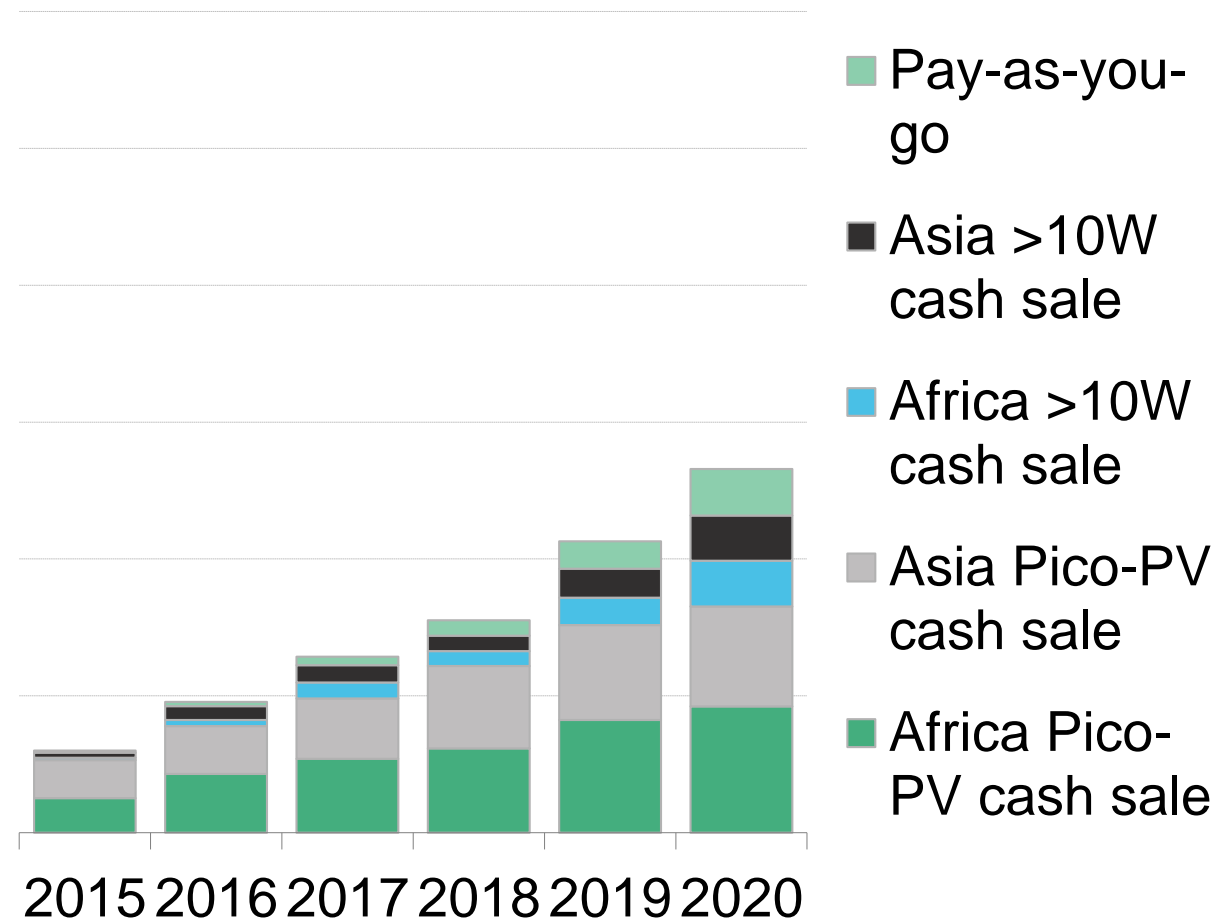
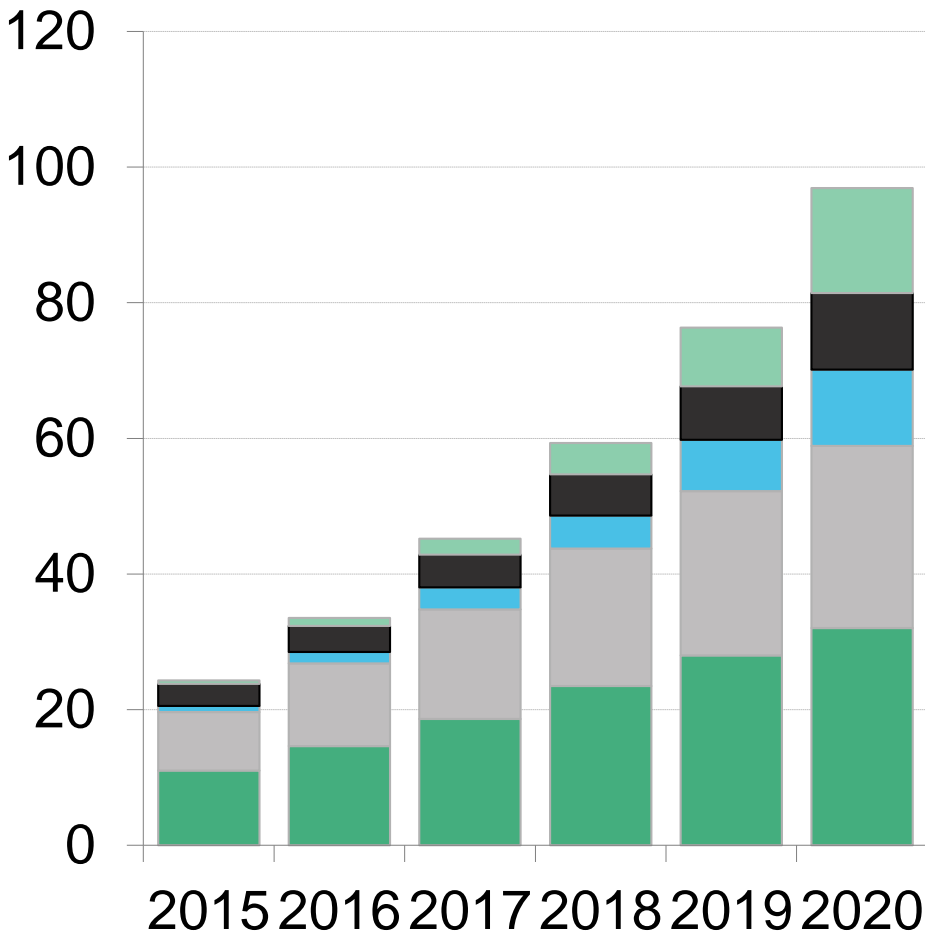


Source: Bloomberg New Energy Finance, Lighting Global; Lilien, Rangaswamy and Van den Bulte, 1999

CASH SALES AND PAYG SALES FORECAST

**FORECAST USERS
(M HOUSEHOLDS)**

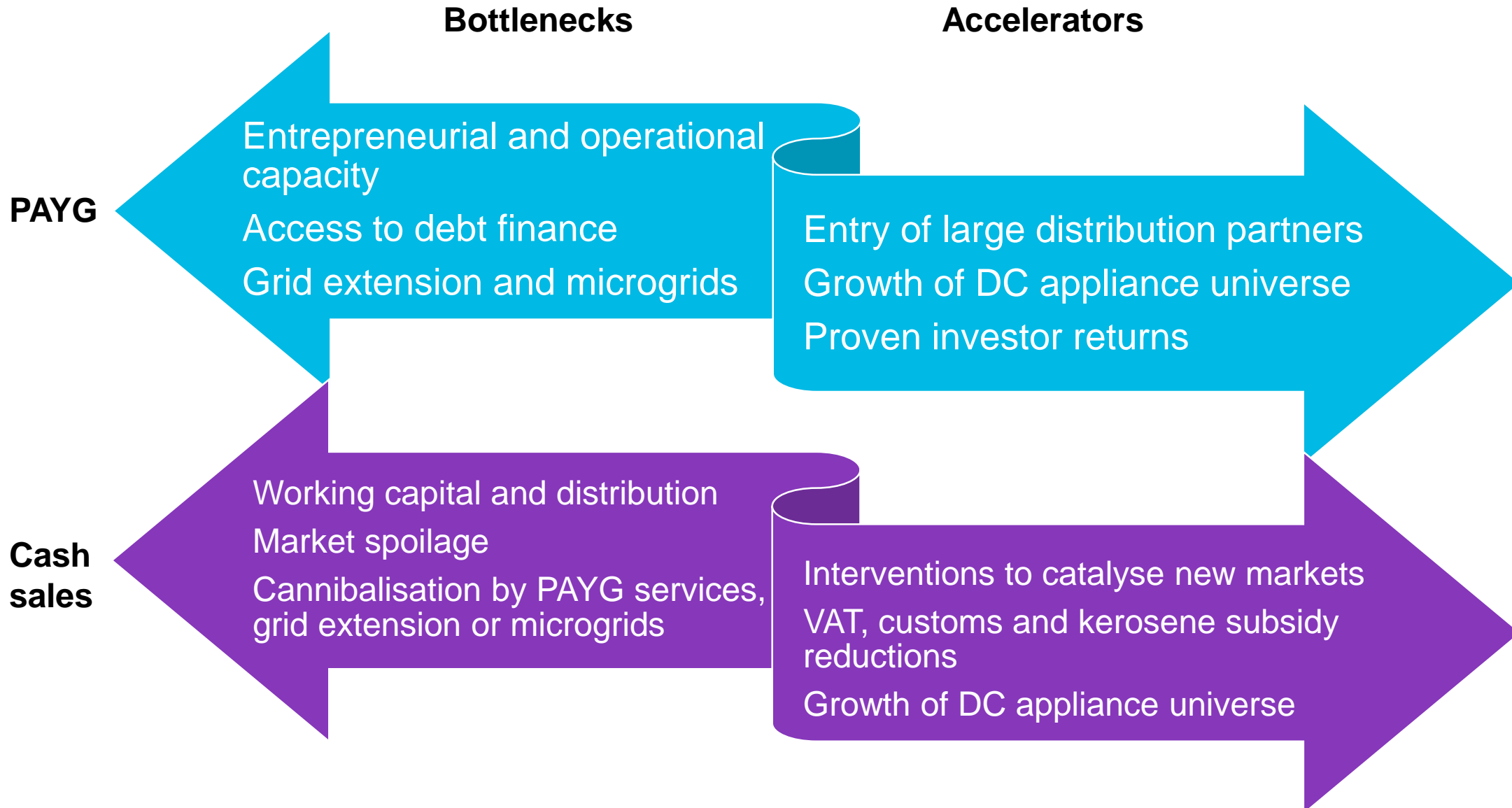
**FORECAST ANNUAL SALES
(M UNITS)**



Note: Sales through third-parties with consumer finance offerings are captured in cash sales. Sales projections assume product lifetime of three years and an increasing share of households to purchase a second device after one year.

Source: Bloomberg New Energy Finance

POTENTIAL BOTTLENECKS AND ACCELERATORS



Source: Bloomberg New Energy

UBIQUITOUS PRODUCT MARKET

- Low product differentiation
- Weak customer relationships
- Little brand identification
- High volume, low margins
- Risk of low quality



PREMIUM BRAND MARKET

- Brand identification with manufacturer
- Few dominant players
- Product rather than service focus



RELATIONSHIP MARKET

- Strong consumer relationships around multiple products + services
- Brand identification with distributor



Source: Bloomberg New Energy Finance

THREE PATHWAYS TO SUCCESS

UBIQUITOUS PRODUCT MARKET

PREMIUM BRAND MARKET

RELATIONSHIP MARKET

- High value, premium branding/products
- Modular products or bundled offerings
- Counterfeit enforcement
- Minimum quality and service standards



Source: Bloomberg New Energy Finance

MARKETS

Renewable Energy
Energy Smart Technologies
Advanced Transport
Gas
Carbon and RECs

SERVICES

Americas Service
Asia Pacific Service
EMEA Service
Applied Research
Events and Workshops

Unique analysis, tools and data for decision-makers
driving change in the energy system

sales.bnef@bloomberg.net

Itamar Orlandi

iorlandi@bloomberg.net

Bloomberg
NEW ENERGY FINANCE