



2017

Generation Investment Management
Sustainability Trends Report

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Important information

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The information presented herein is based on Generation's analysis of publicly available data and intended to present a global perspective of the different areas that Generation believes represent a sustainable economy. The jurisdictions and time periods presented herein may vary, as the data shown is what Generation used in its own assessment and believes to be the most complete view to support each identified area of sustainability and associated trends. 2016 and other historic estimates made throughout the report were extrapolated from cited research and based on previous trends and known current data. While the data is from sources Generation believes to be reliable, Generation makes no representation as to the completeness or accuracy of the data.

Commercial indicators capturing significant trends and opportunities towards a more sustainable economy.

Foreword

We are pleased to introduce Generation Investment Management's first Sustainability Trends Report, which documents the progress towards a more sustainable global economy.

Generation was founded in 2004 on the principle that long-term investing is best practice for investors and society alike. We believe it is critical for businesses and markets to understand the nature and magnitude of our sustainability challenges, as well as the related opportunities. To support that endeavour, we have created this compendium of commercial opportunities in sectors which we believe are central to the move towards a low carbon, prosperous, equitable, healthy and safe society.

The trends in this report capture only the early stages of the "Sustainability Revolution". The risks posed by our many

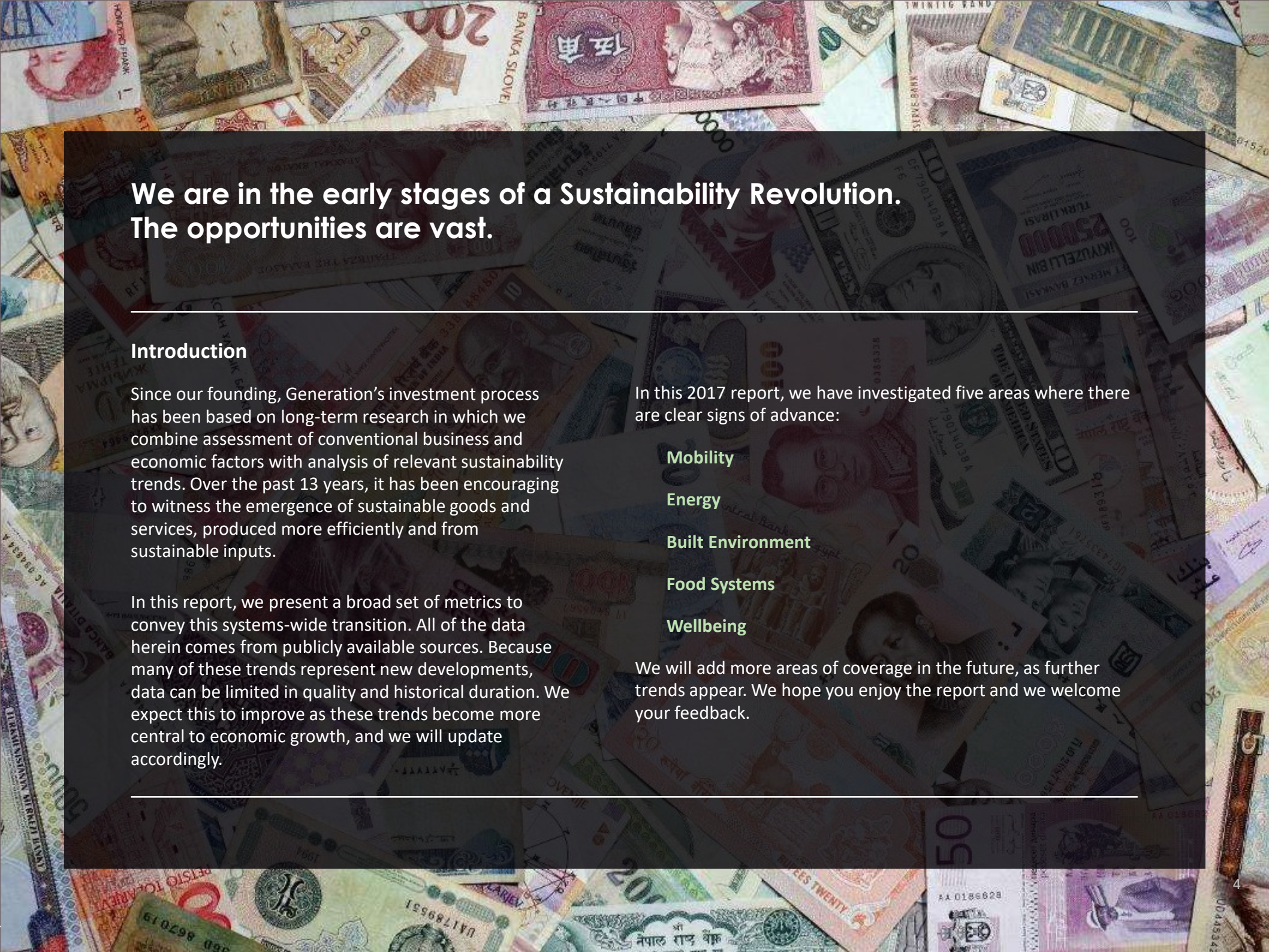
environmental and social challenges, from climate change to inequality, remain significant. Our journey to a fully sustainable economy will require considerable changes in attitudes and behaviors from all stakeholders, and supportive policies at local, national and international levels. We do not pretend business alone can provide all the answers.

However, it is clear to us that many businesses are embarking on the journey, and are bringing new, more sustainable technologies to market and to ever greater scale. Such businesses are delivering growth, profits and employment, while shifting society and the planet to a more sustainable footing.

Progress is underway. Yet the magnitude of opportunity remains vast.

Al Gore
Chairman

David Blood
Senior Partner



We are in the early stages of a Sustainability Revolution. The opportunities are vast.

Introduction

Since our founding, Generation's investment process has been based on long-term research in which we combine assessment of conventional business and economic factors with analysis of relevant sustainability trends. Over the past 13 years, it has been encouraging to witness the emergence of sustainable goods and services, produced more efficiently and from sustainable inputs.

In this report, we present a broad set of metrics to convey this systems-wide transition. All of the data herein comes from publicly available sources. Because many of these trends represent new developments, data can be limited in quality and historical duration. We expect this to improve as these trends become more central to economic growth, and we will update accordingly.

In this 2017 report, we have investigated five areas where there are clear signs of advance:

Mobility

Energy

Built Environment

Food Systems

Wellbeing

We will add more areas of coverage in the future, as further trends appear. We hope you enjoy the report and we welcome your feedback.

An enduring and equitable economy is characterised by sustainable...

Mobility

Built Environment

Energy

Wellbeing

Food Systems





MOBILITY

We believe a sustainable system of personal mobility is centred around:



Electrification
& decreased
emissions



Reduced road
congestion from
fewer privately
owned vehicles



On demand
services leading
to better
use of idle assets



Enhanced
synergy amongst
more efficient modes
of transport

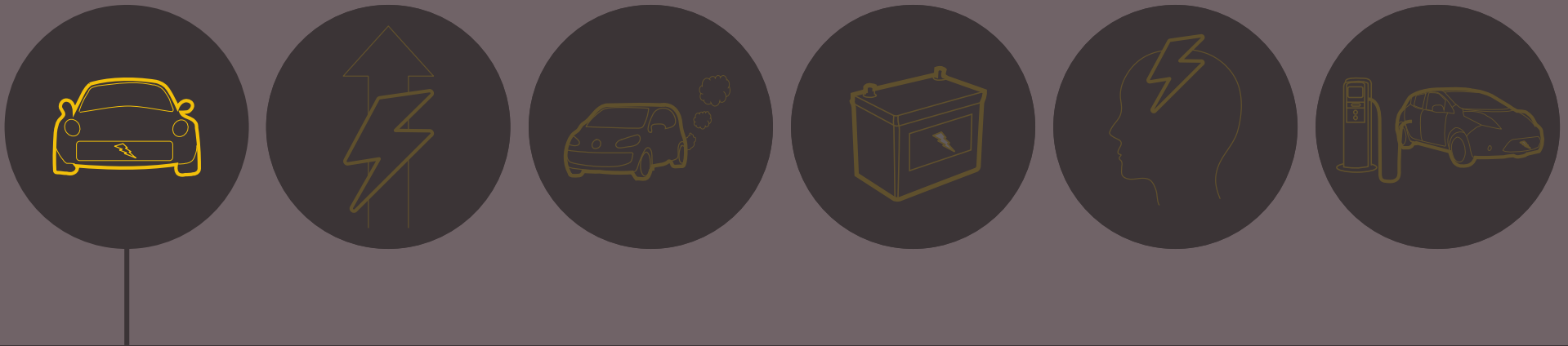


Improved road
safety catalysed
by autonomy

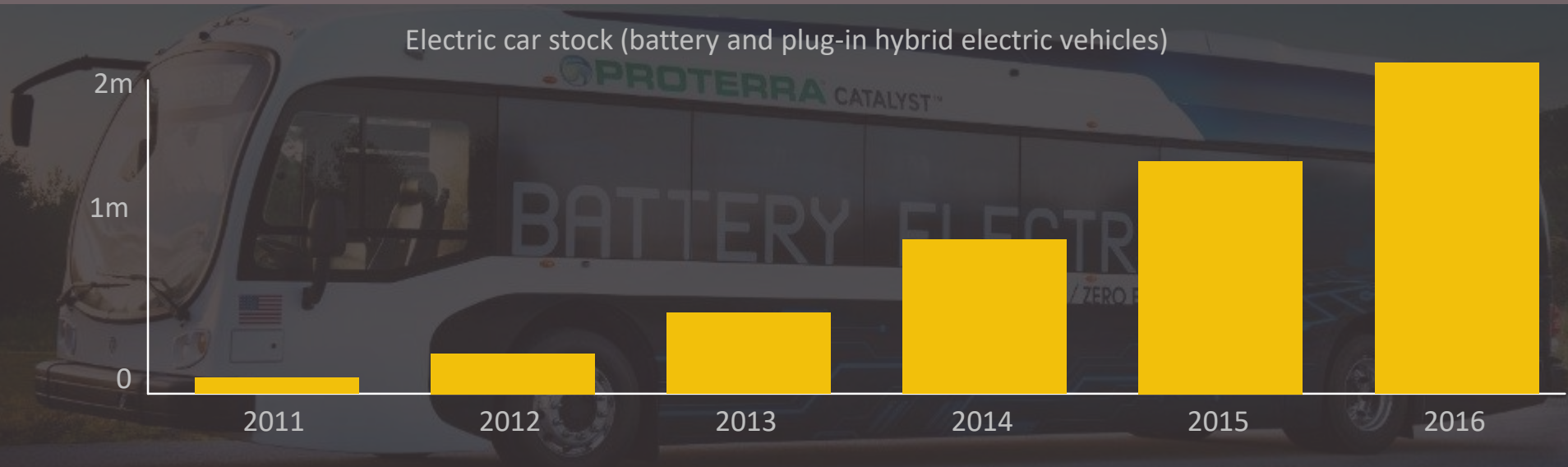


Transport solutions
with positive
societal
externalities

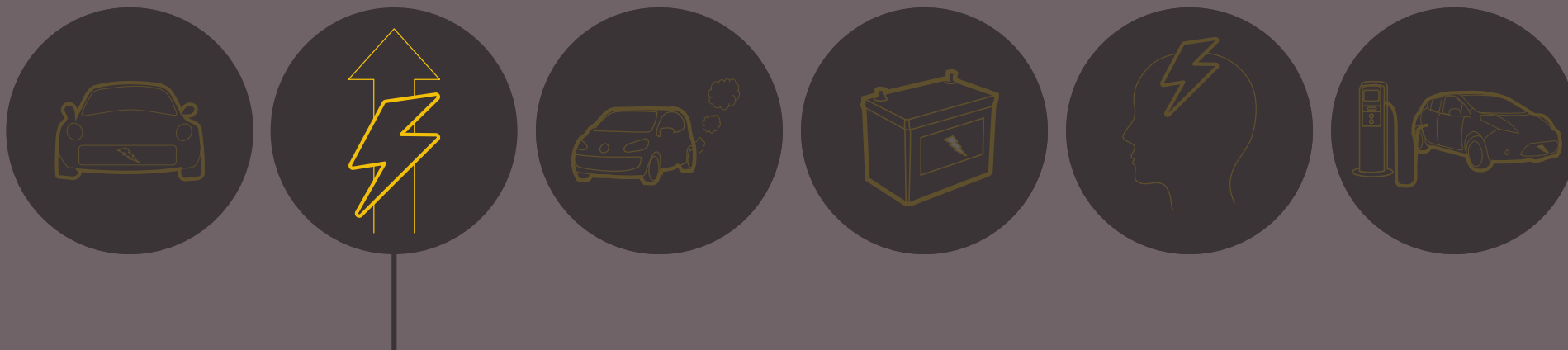
The market for electric vehicles is gaining momentum



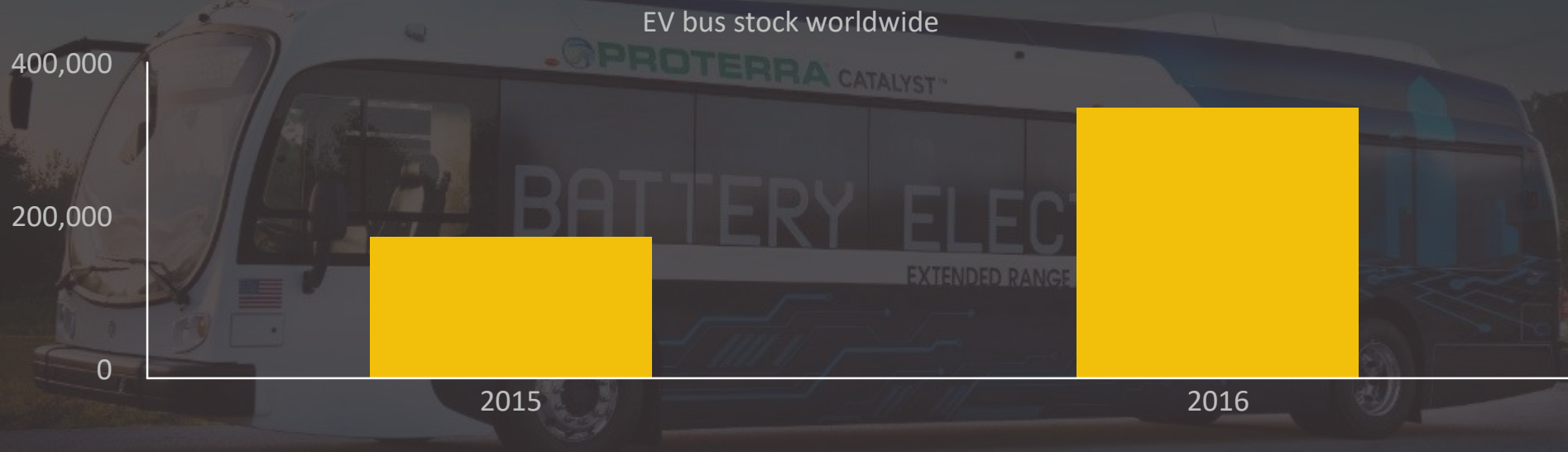
As of January 2017, the number of electric vehicles (EVs) on the road worldwide surpassed 2 million



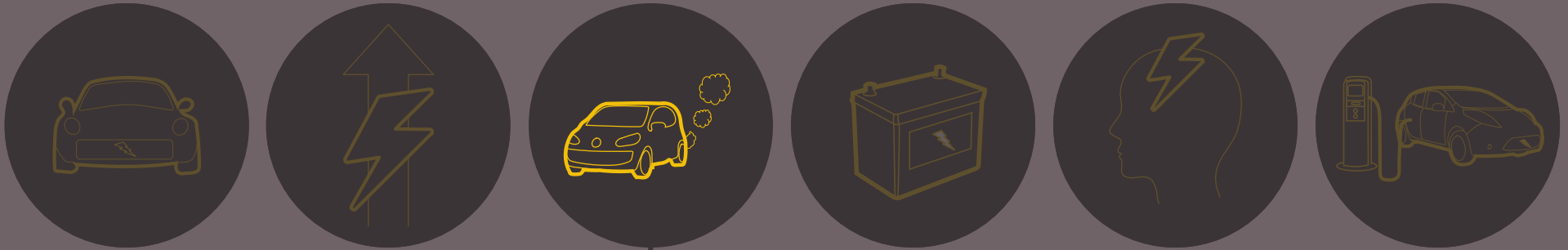
The market for electric vehicles is gaining momentum



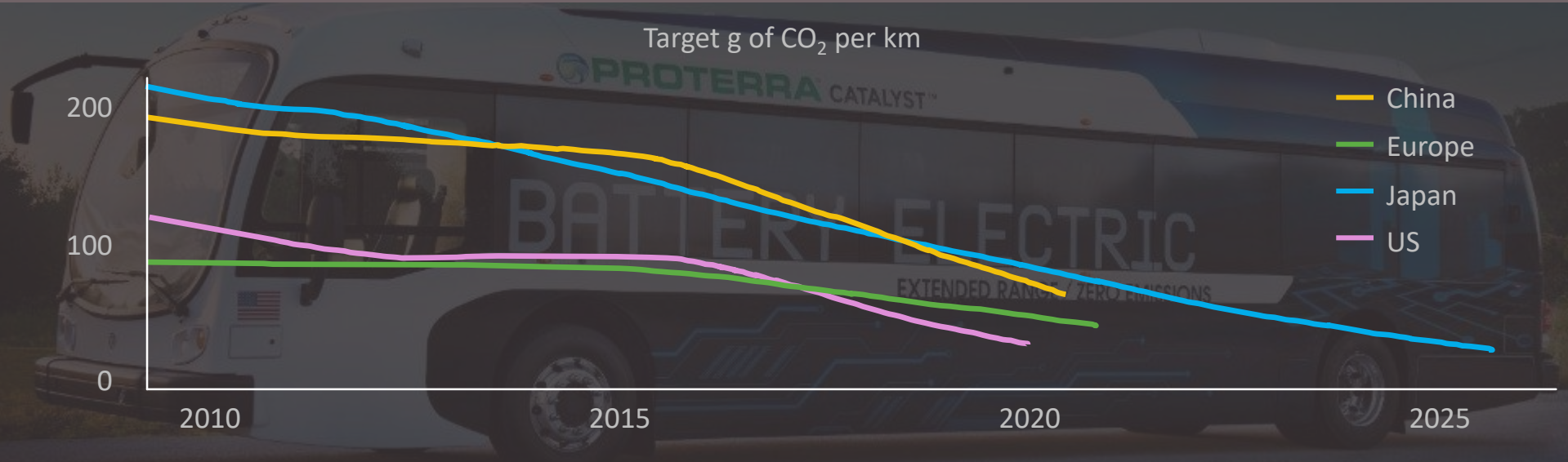
The global battery-powered bus stock doubled in 2016, and further market growth was evidenced globally in the two- and three-wheeler markets



The market for electric vehicles is gaining momentum



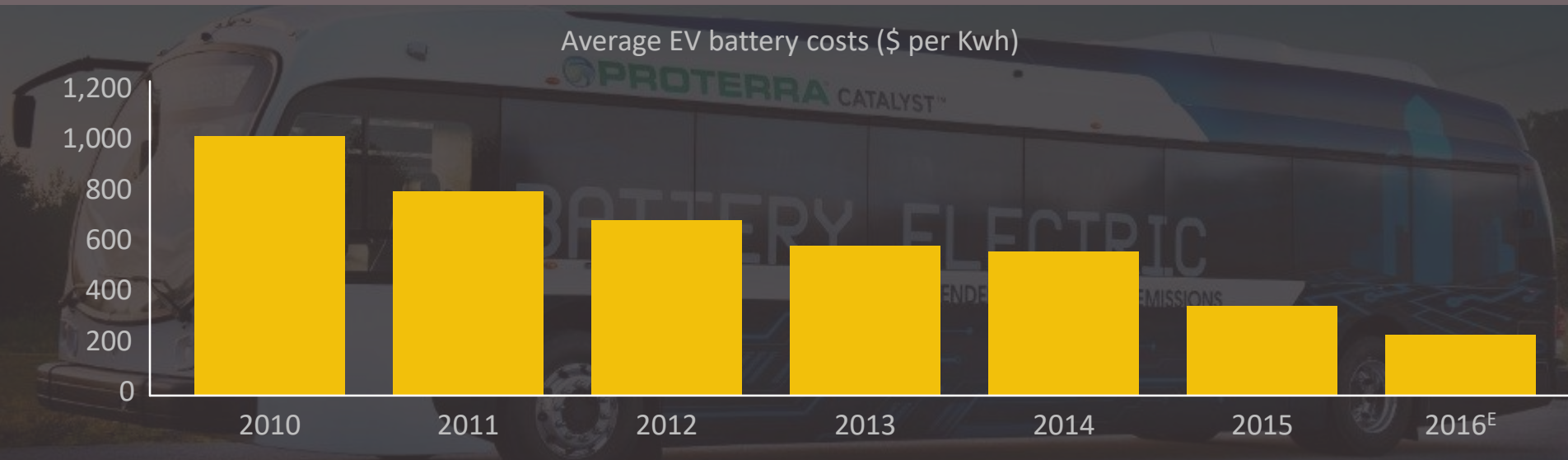
Progress has been catalysed by ambitious government targets around vehicle emissions:
6 countries have seen EVs surpass 1% of total market share



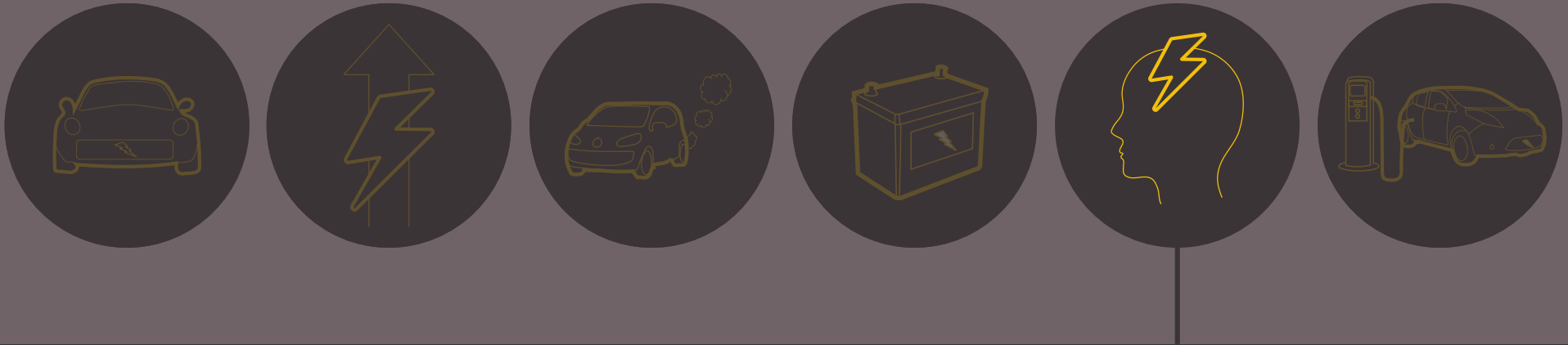
The market for electric vehicles is gaining momentum



Progress has also been facilitated by the declining price of electric-car batteries

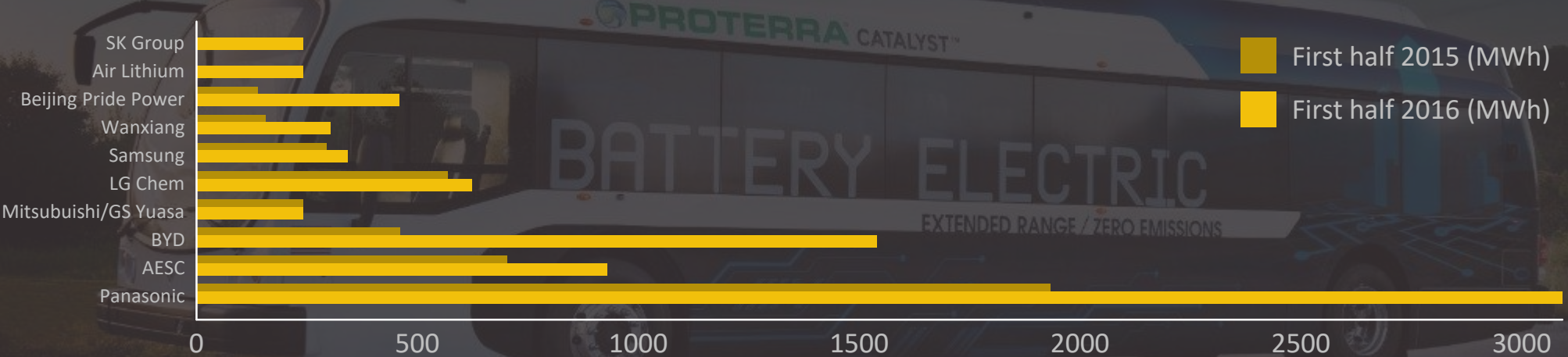


The market for electric vehicles is gaining momentum

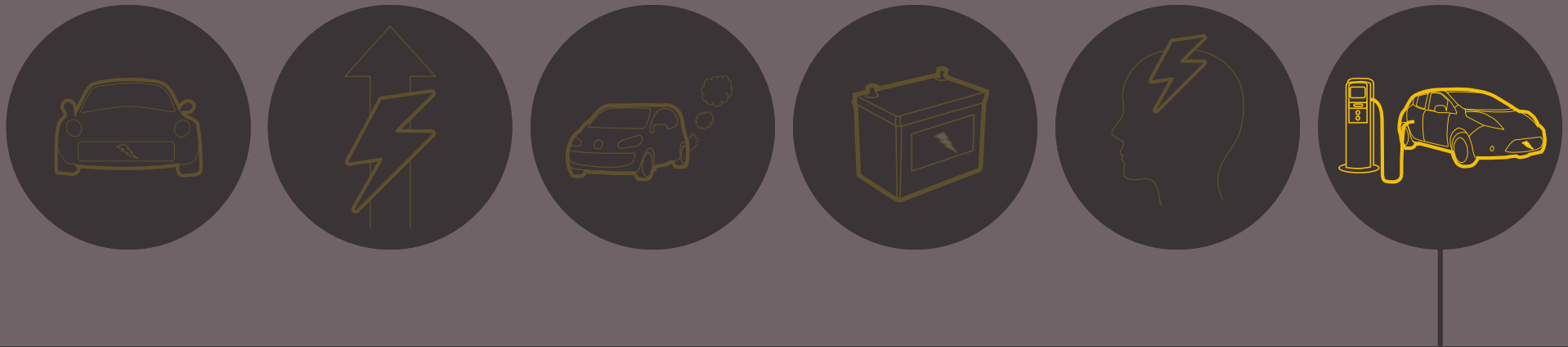


Consumer demand for EVs is being matched by innovation and greater supply from battery producers

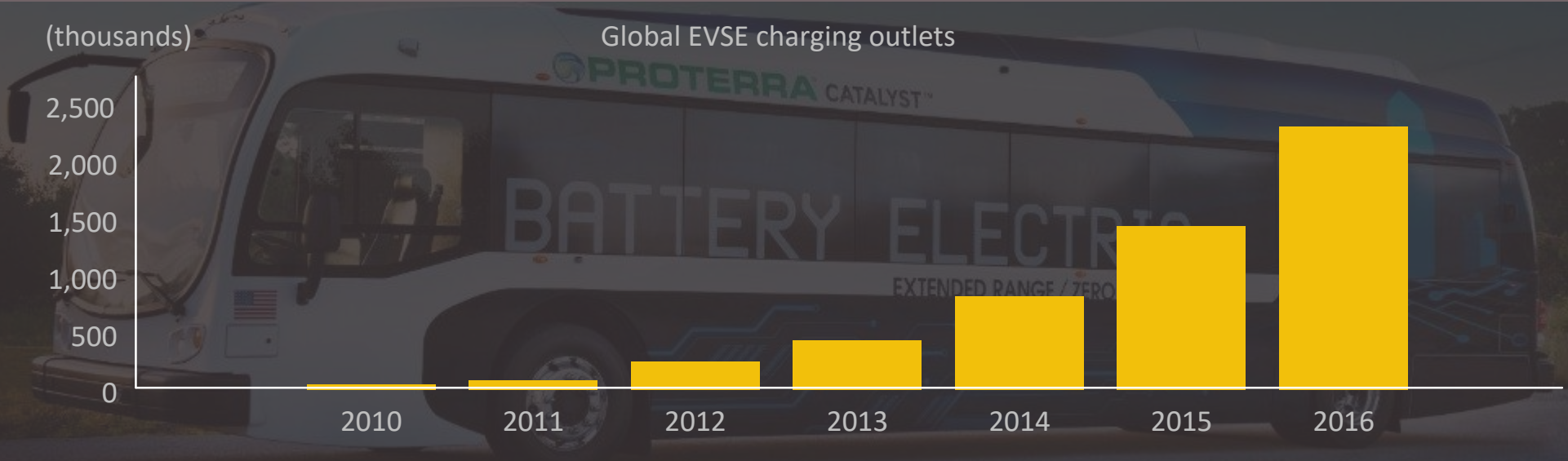
EV battery production by top 10 producers



The market for electric vehicles is gaining momentum



Advanced infrastructure developments, such as charging sites, draw users in



Source: IEA, 2017 Note: EVSE—Electric-vehicle supply equipment

Early signs suggest private car ownership may be on track to decline, leading to reduced congestion

Is “peak car” – defined by a plateau in sales – imminent in developed markets?

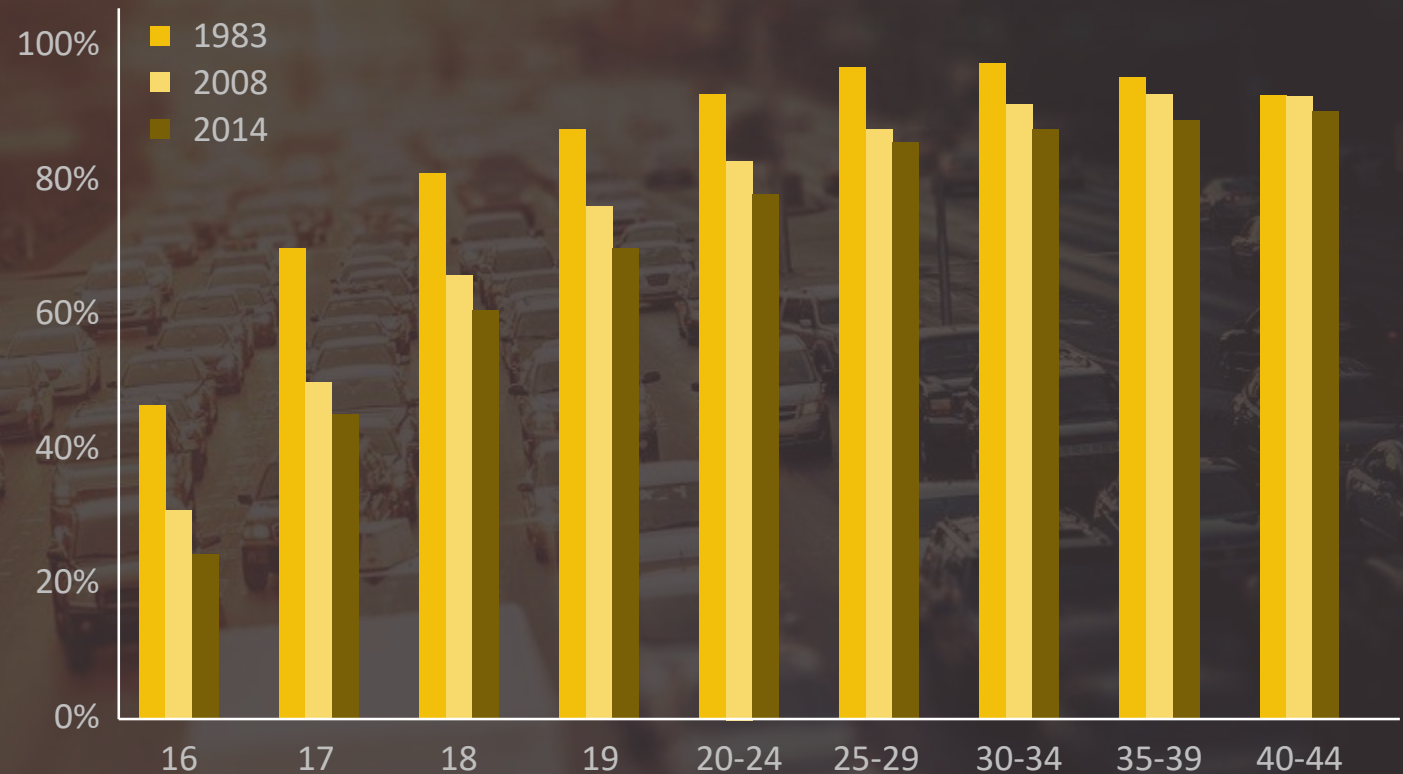


Early signs suggest private car ownership may be on track to decline, leading to reduced congestion

Younger cohorts exhibit less interest in acquiring a driving licence

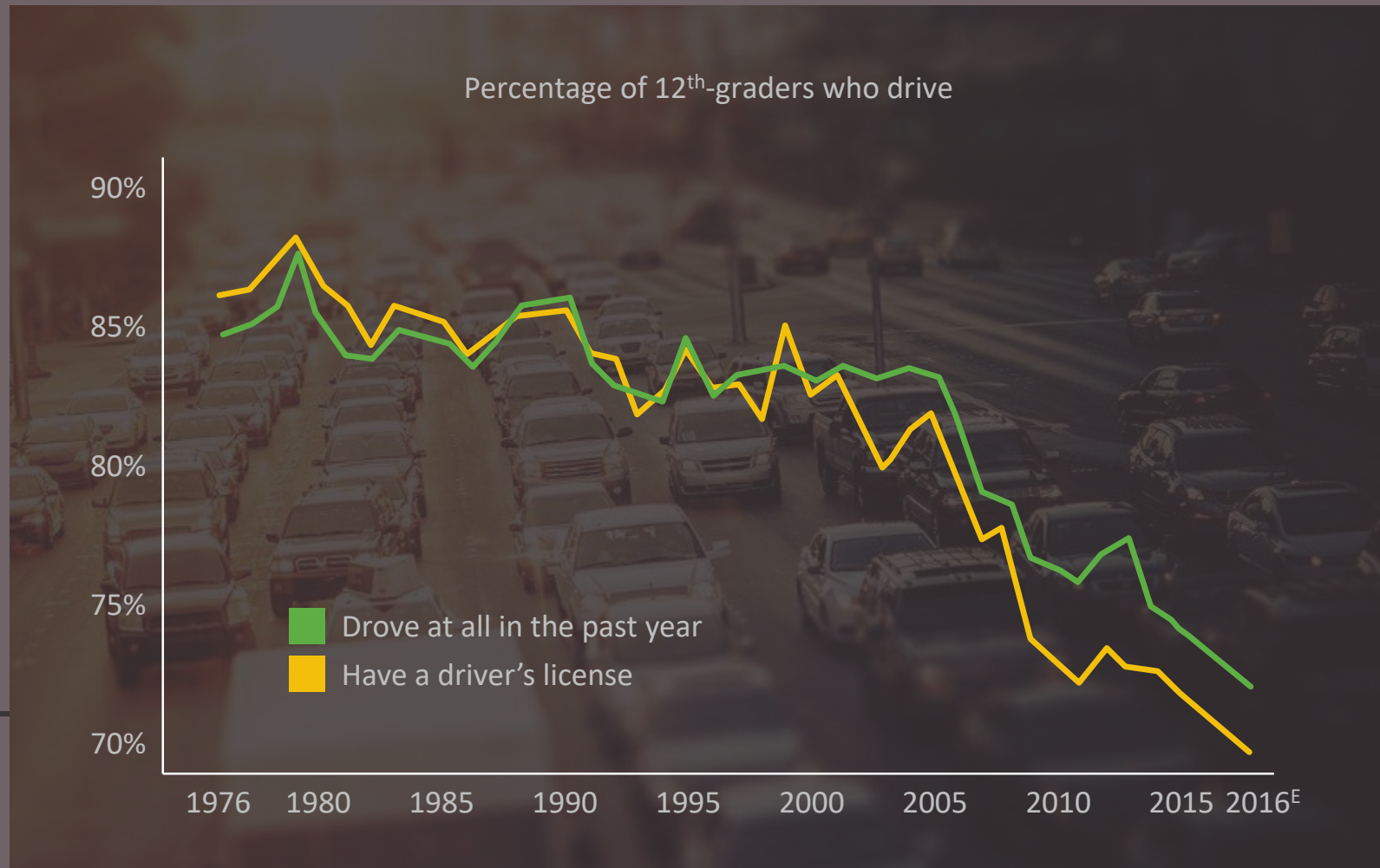


Licensed drivers as percentage of population in the US, by age group



Early signs suggest private car ownership may be on track to decline, leading to reduced congestion

This trend is especially pronounced in millennials



Increased connectivity has facilitated 'mobility-as-a-service' models

People are more connected than ever before...



Increased connectivity has facilitated 'mobility-as-a-service' models

...allowing the emergence of disruptive operational models that have efficiency propositions relative to private car usage

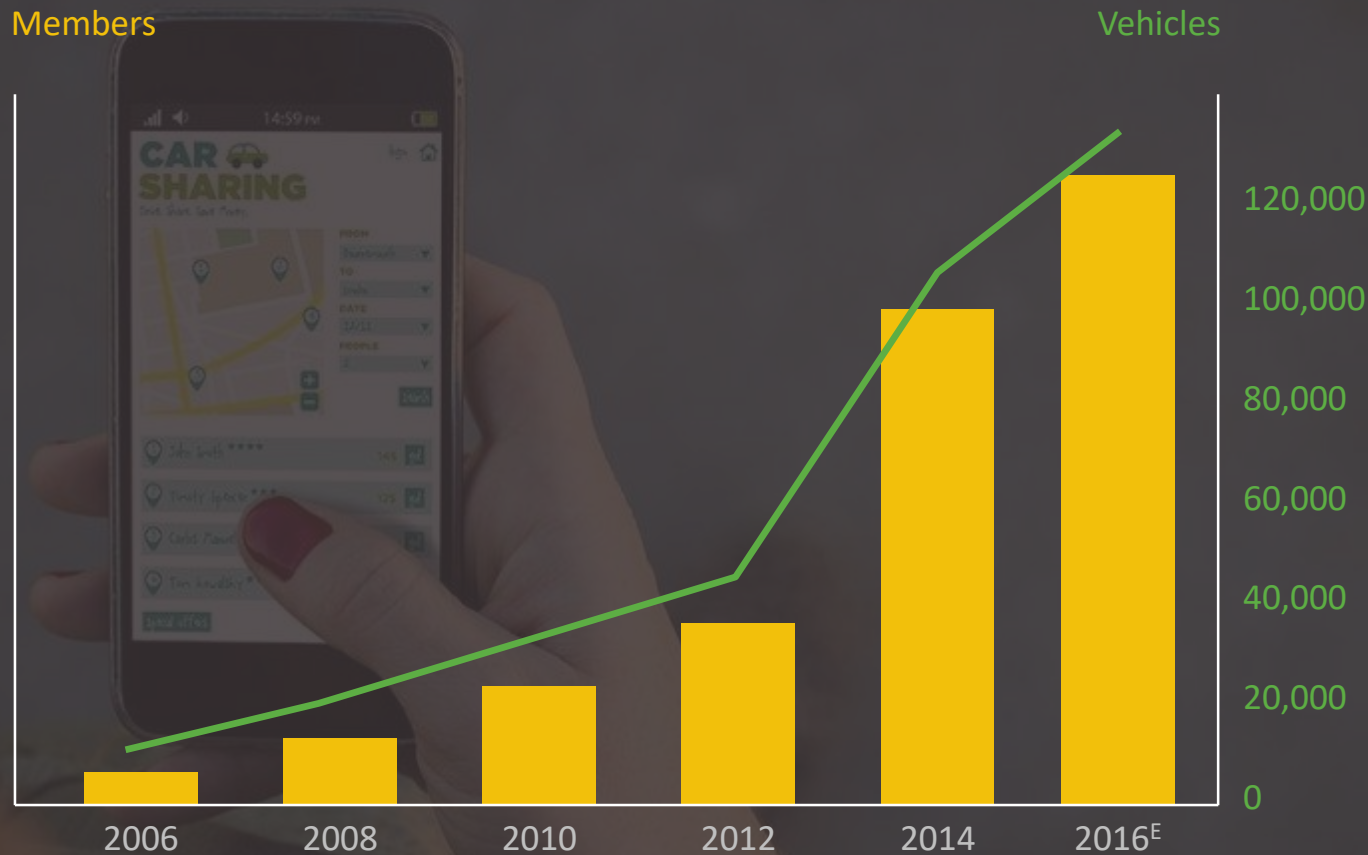
Uber: total global trips taken

Didi: daily number of daily rides



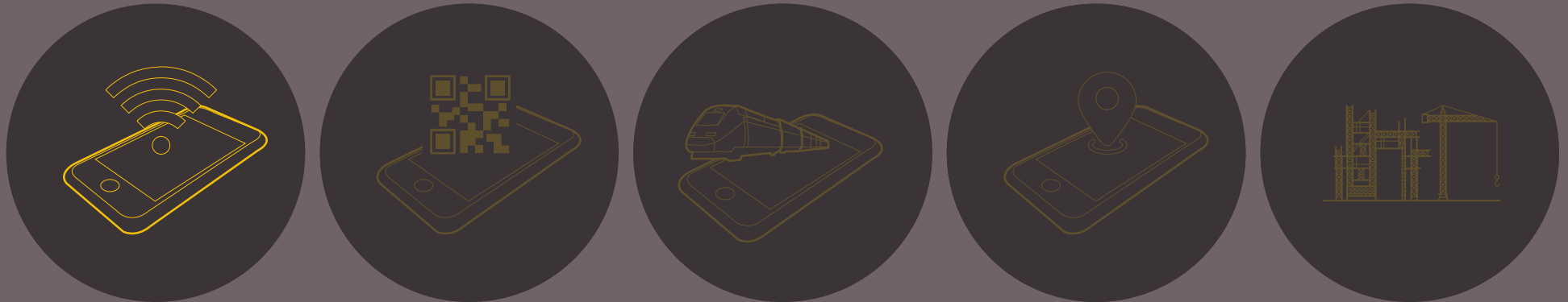
Increased connectivity has facilitated 'mobility-as-a-service' models

Similarly, global car-sharing membership has grown dramatically



Source: TSRC, Winter 2016 Carsharing Outlook Note: Numbers reflect business-to-consumer (B2C) carsharing only, including one-way operations

Digitisation of the travel experience is enhancing access to more efficient modes of transportation



Travel sales – including bus and rail – by mobile devices are growing as more people turn to a digital booking experience

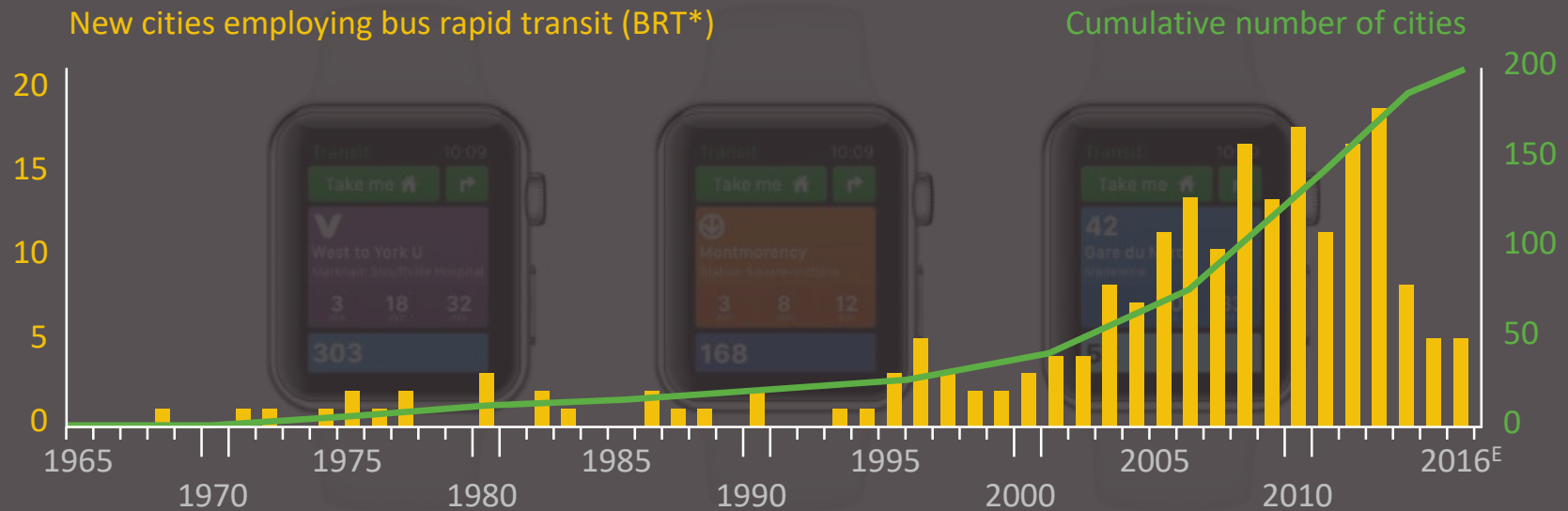
Mobile travel sales to residents by region (US\$ billion)



Digitisation of the travel experience is enhancing access to more efficient modes of transportation



Innovations in ticketing and other infrastructure have corresponded to an uptick in use of public transport

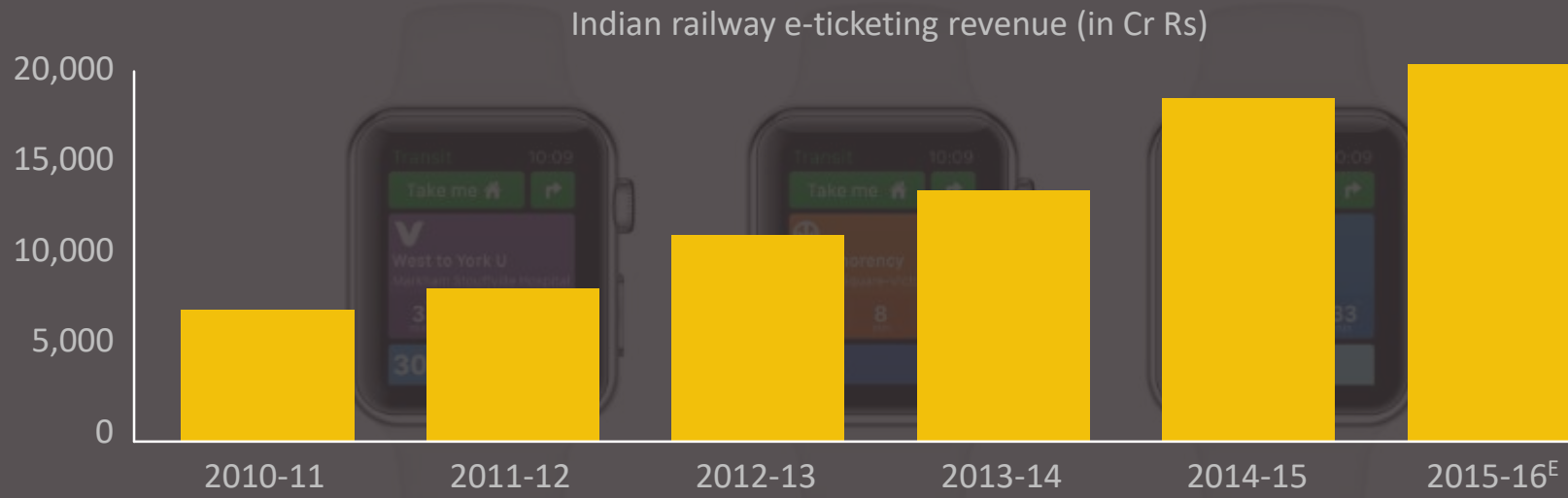


Source: BRTData Note: BRT is a bus-based public transport system designed to improve capacity and reliability

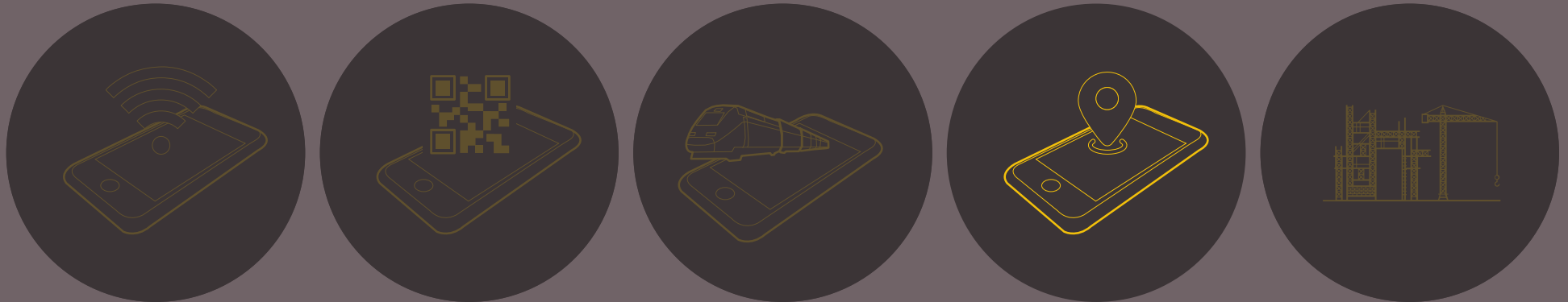
Digitisation of the travel experience is enhancing access to more efficient modes of transportation



Improvements in access to public transport via digitisation are also seen in emerging markets



Digitisation of the travel experience is enhancing access to more efficient modes of transportation

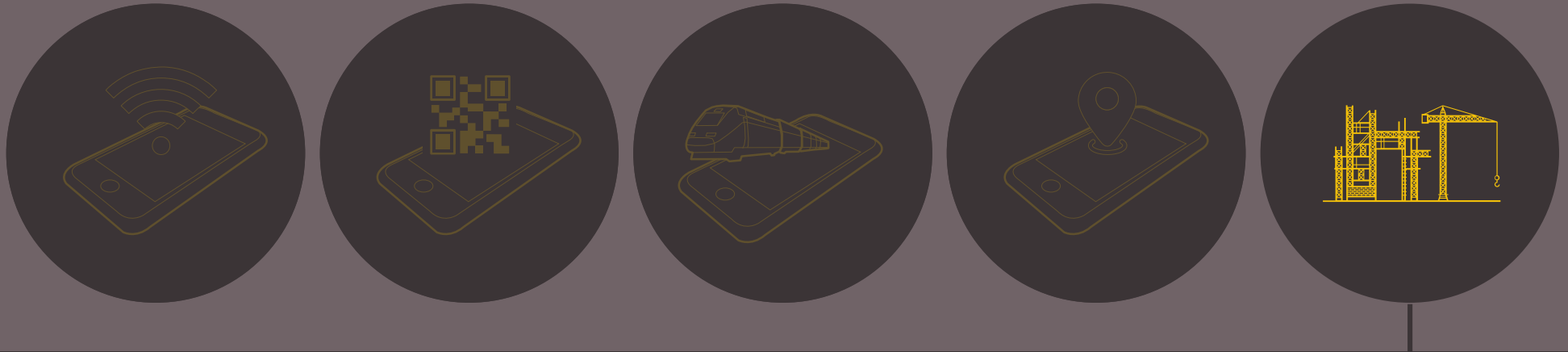


Further enhancements in multimodal booking is helped by the growth of location-based services

Share of US smartphone owners using location-based information services

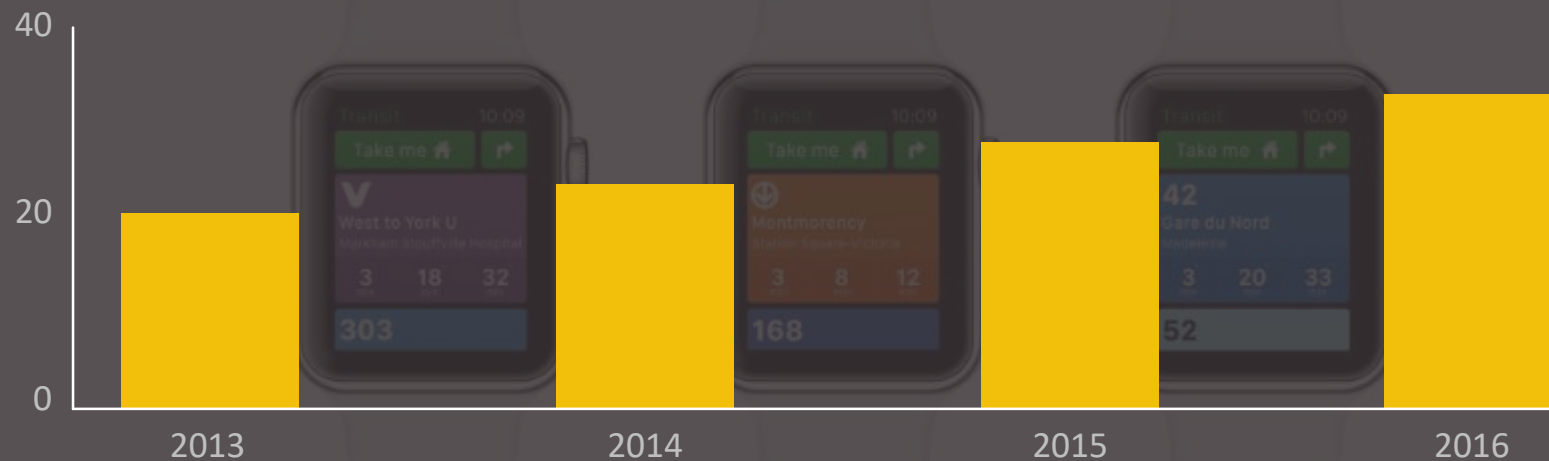


Digitisation of the travel experience is enhancing access to more efficient modes of transportation



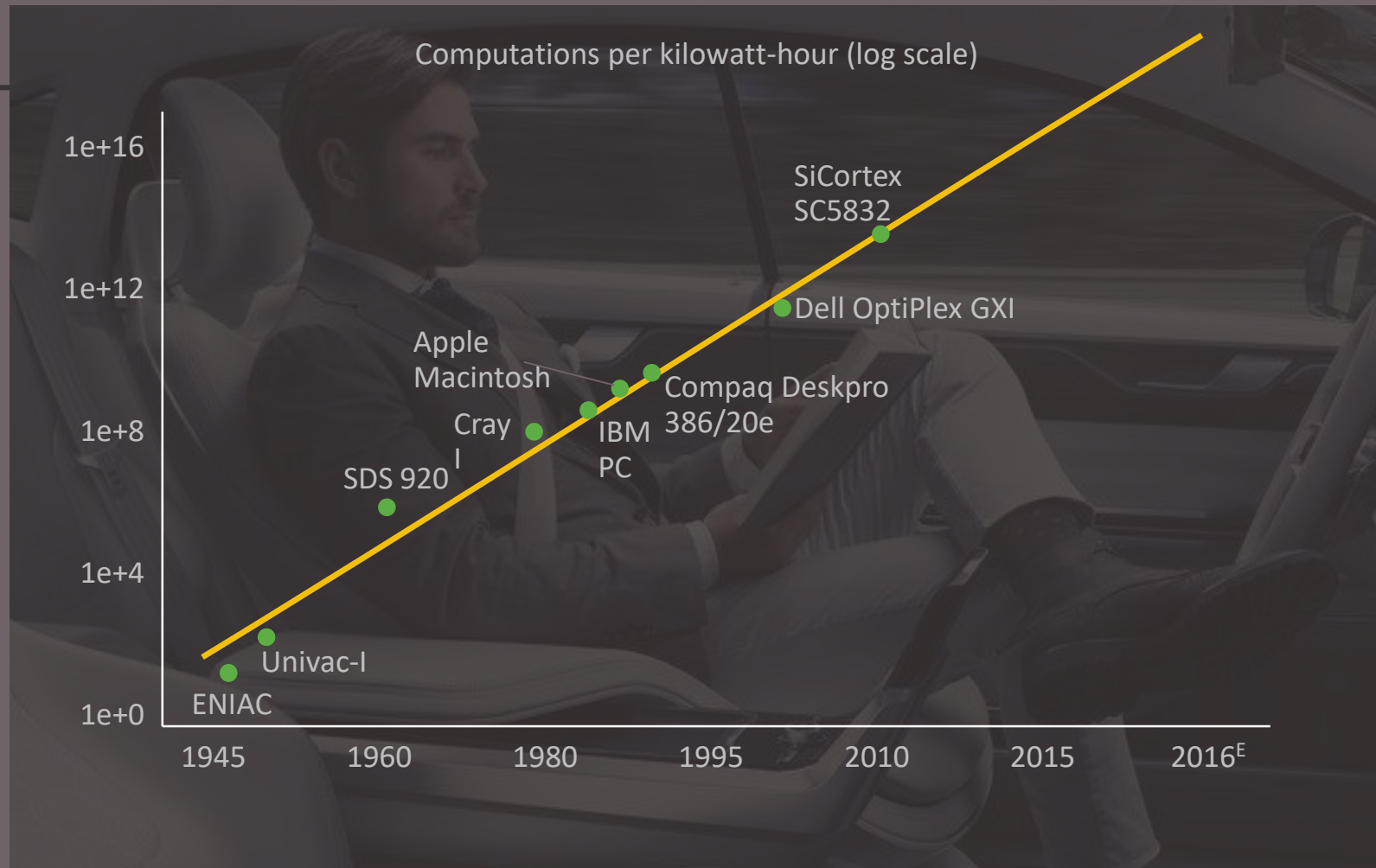
And all of this is made feasible by an increased focus on city-level policy innovation and smart infrastructure investment

Number of smart cities worldwide, as per IHS Technology's definition of a "smart city"*



Improving computational efficiency has led to increased vehicular connectivity and autonomy

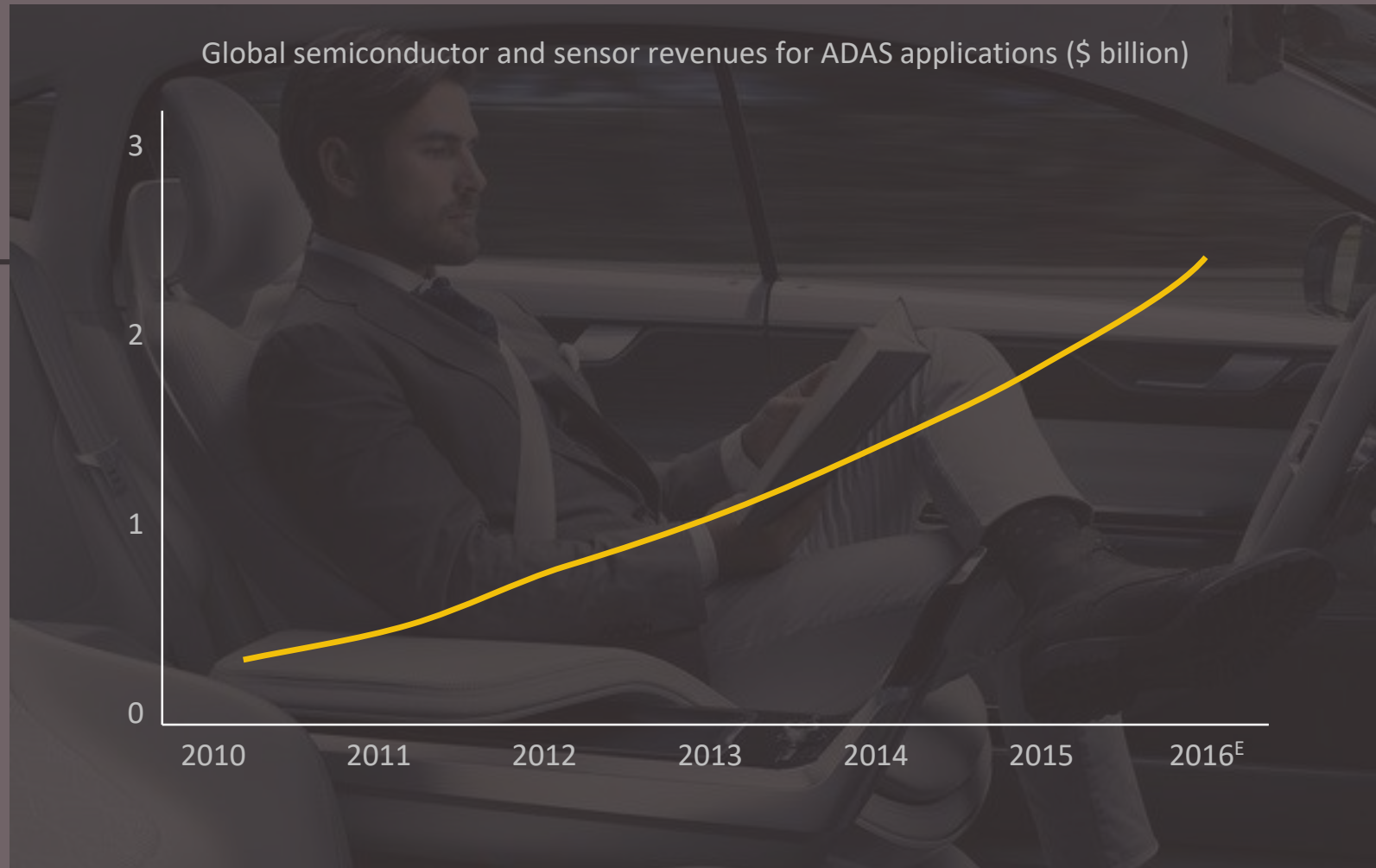
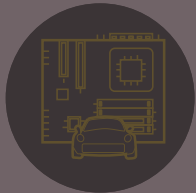
Complete with CPUs, GPUs, cameras, sensors, and networking hardware, cars continue to take advantage of increases in computing efficiency



Source: Jonathan Koomey; The Economist Note: 2010-2016 estimates based on extrapolation from line of best fit

Improving computational efficiency has led to increased vehicular connectivity and autonomy

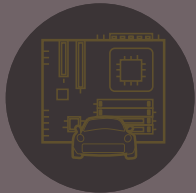
This is evident through growing semiconductor revenues for Advanced Driver Assistance Systems (ADAS)...



Source: IHS ADAS Semiconductor Intelligence Service; McKinsey & Company

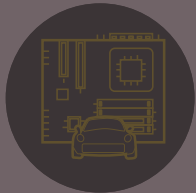
Improving computational efficiency has led to increased vehicular connectivity and autonomy

...and the growing number of car models which now have automated driver assistance technologies



Improving computational efficiency has led to increased vehicular connectivity and autonomy

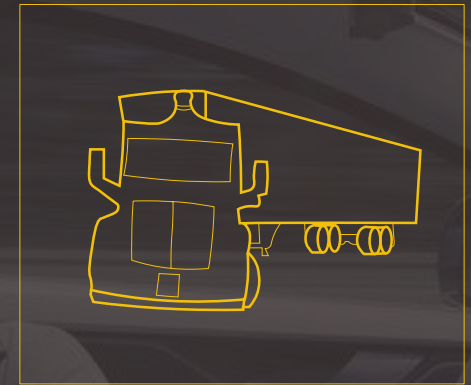
Companies are announcing fully autonomous capabilities for the very near future



Tesla aims for the Model 3 to be the first mass-market autonomous car



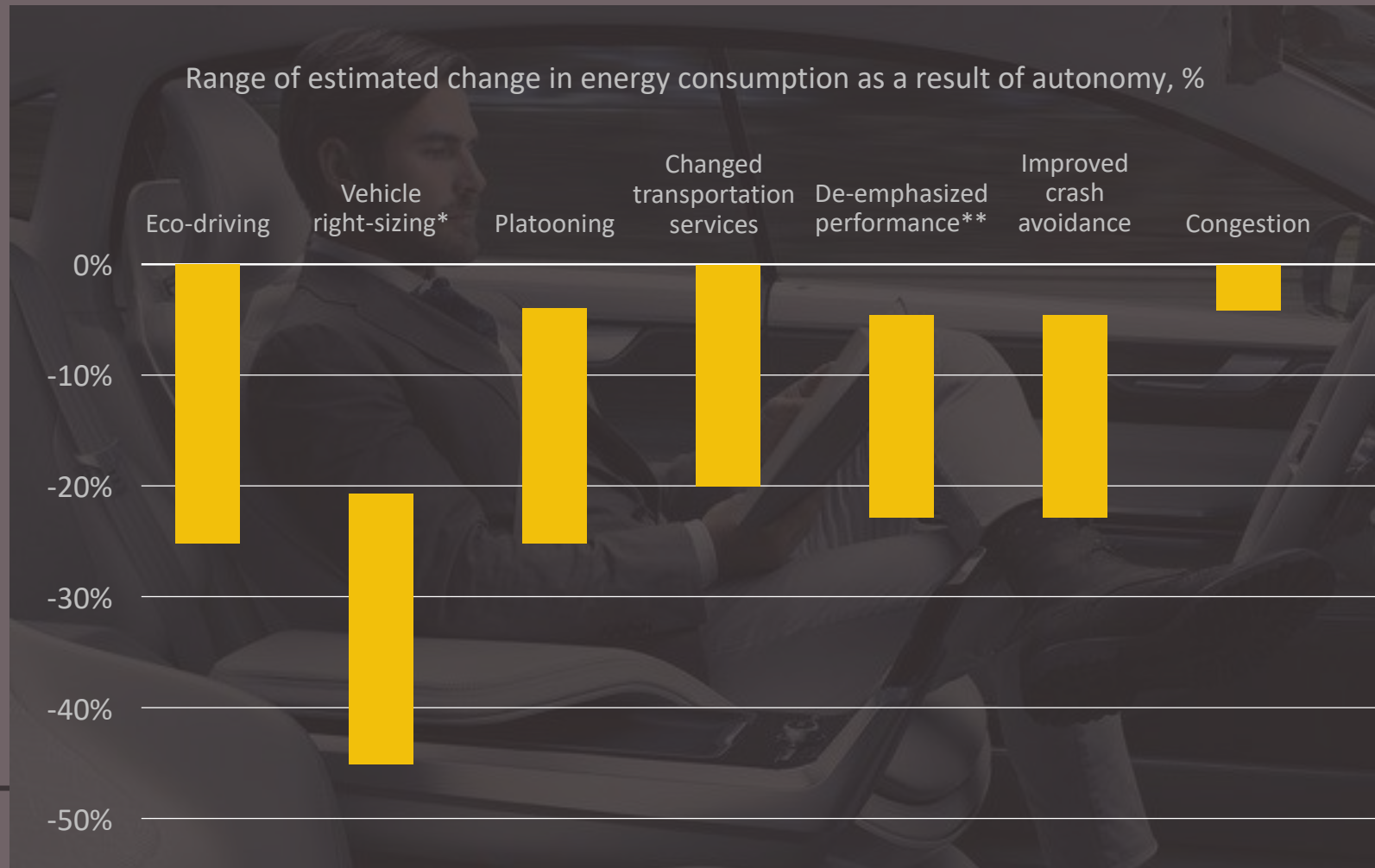
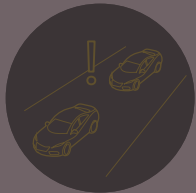
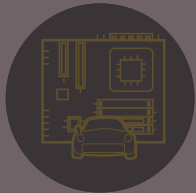
Uber released its autonomous cars in Pittsburgh as part of a pilot programme in September 2016



Google's Waymo released the first images of its autonomous trucks in early 2017

Improving computational efficiency has led to increased vehicular connectivity and autonomy

Connectivity and autonomy have significant implications on various sustainability considerations, including congestion and fuel consumption

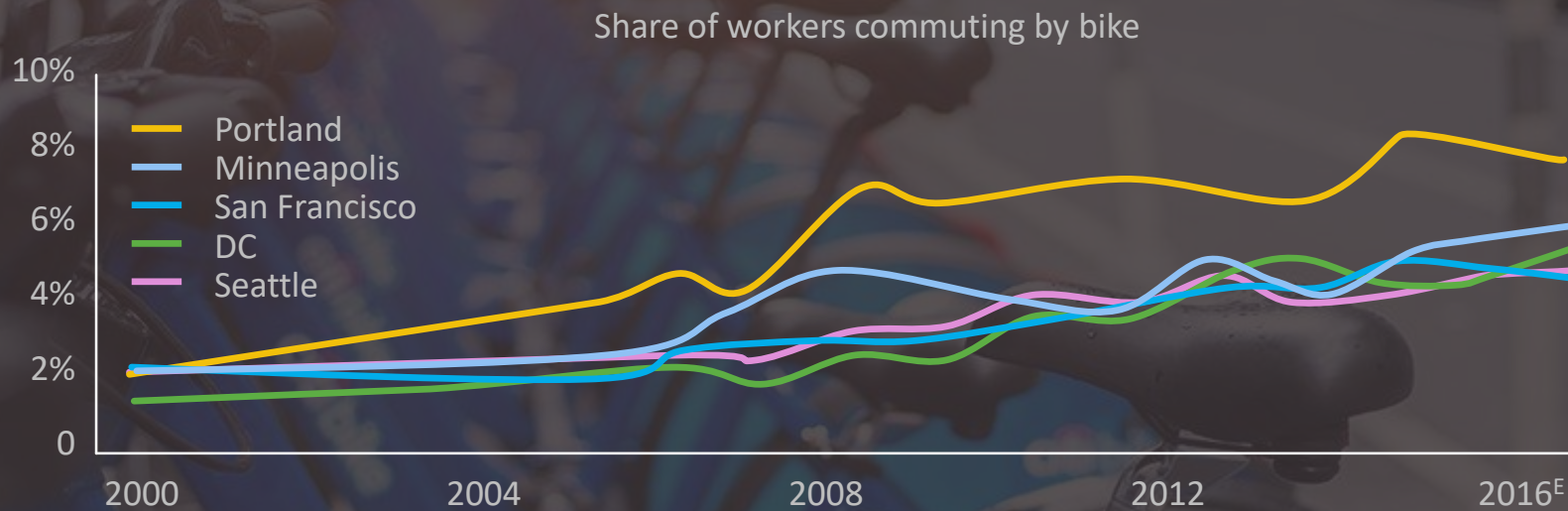


Source: University of Michigan Center for Sustainable Systems 2016 *Note: Right-sizing is the ability to match the utility of a vehicle to a given need; full benefits only likely when paired with a ride-sharing on-demand model **Note: Refers to vehicle performance, such as fast acceleration, which is likely to become de-emphasized when comfort and productivity become travel priorities

The transportation trends also extend to the two-wheel market



Bicycling continues to become a more popular form of commuting to work across the US

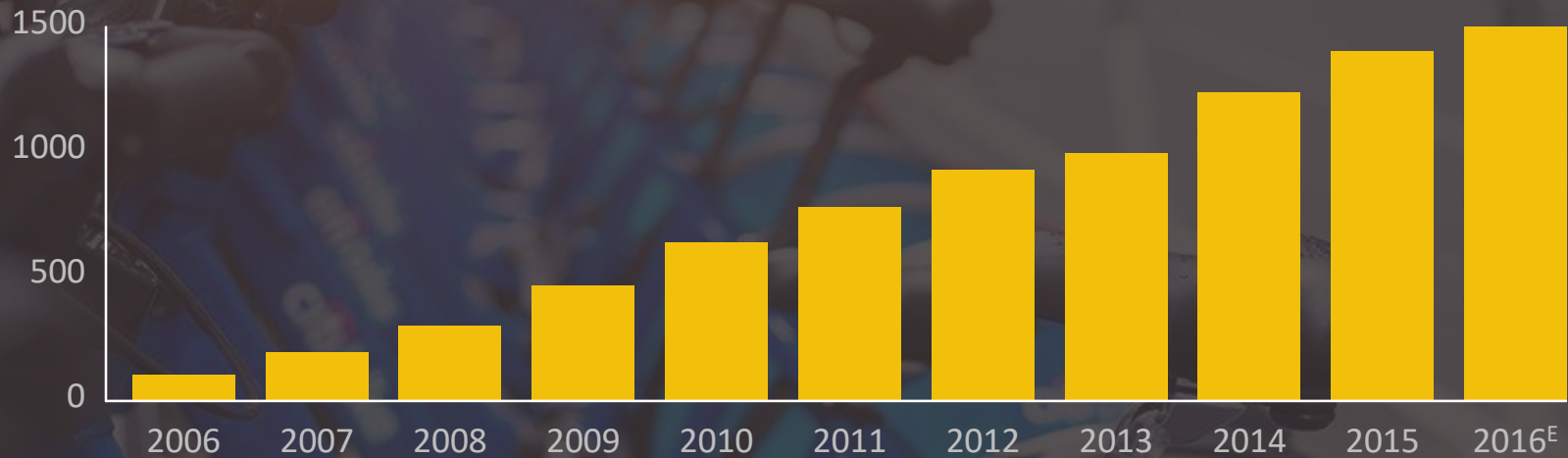


The transportation trends also extend to the two-wheel market



Sales of electric bikes are also on the rise

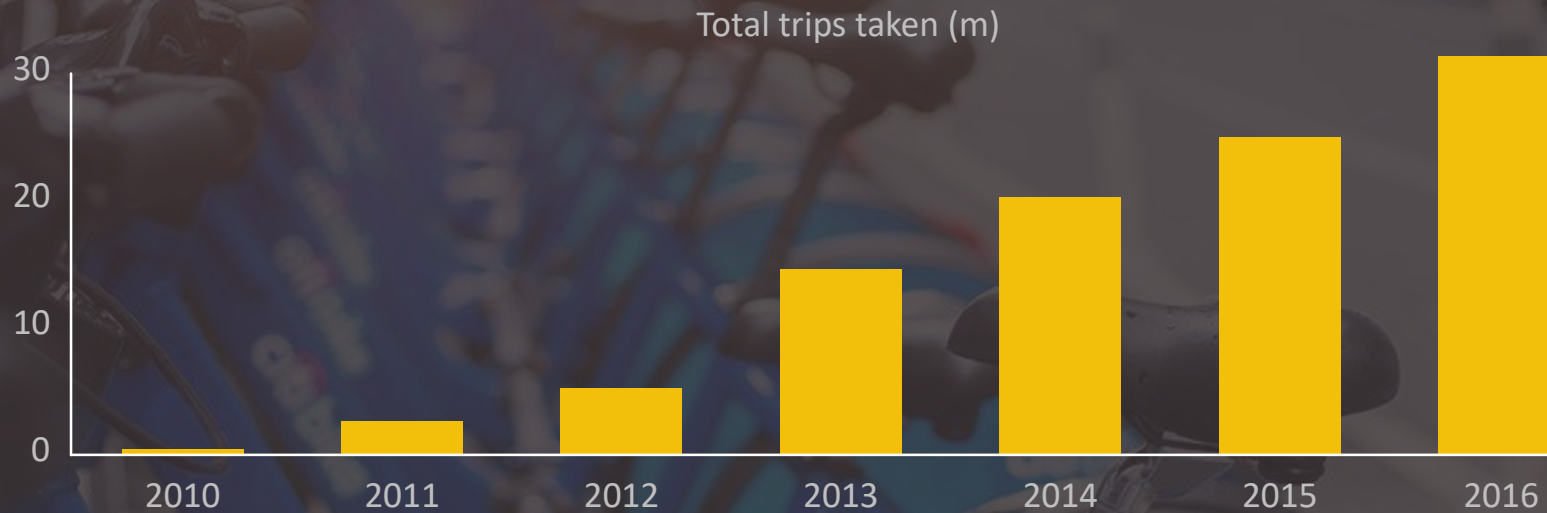
Sales of ebikes in Europe (x1000 units)



The transportation trends also extend to the two-wheel market



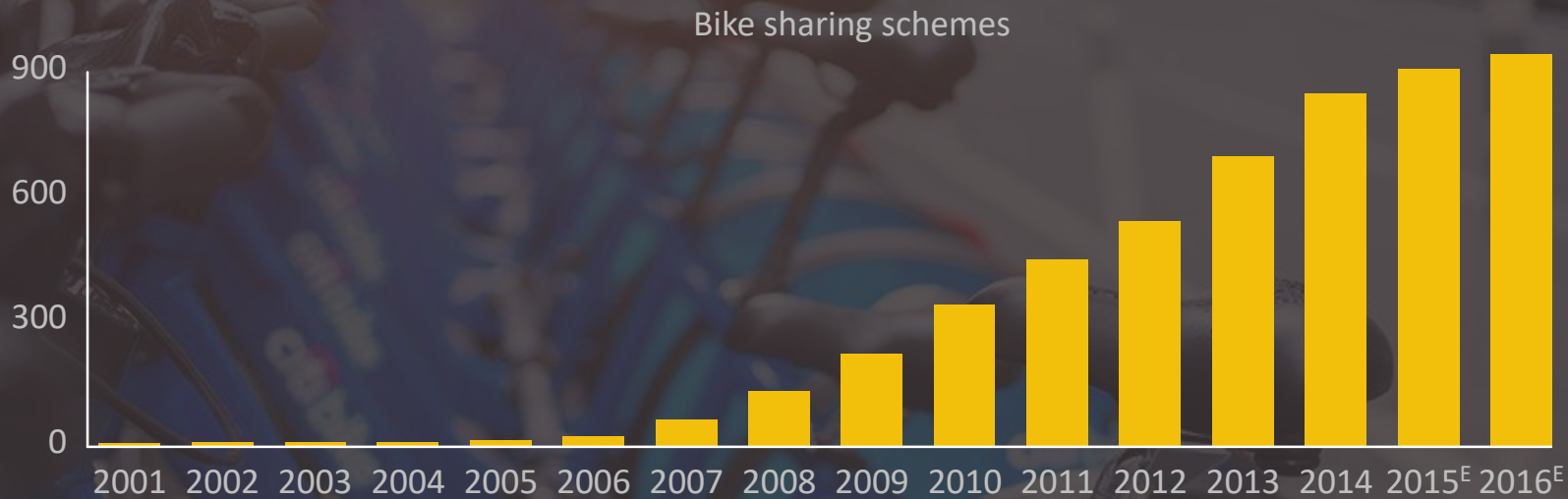
Bike-share ridership in the US has grown over time



The transportation trends also extend to the two-wheel market



And this trend proves to be far-reaching as the number of global bike-sharing schemes continue to increase



Mobility trends to monitor:



Increased global usage of efficient means of public transport and improved access for all



Growth in EV car registrations as a proportion of total cars on the road (plug-in EVs <1% in 2016 according to the IEA), and complementary grid support



Innovation around lithium and cobalt constraints and other sustainable supply-chain considerations



Comprehensive improvements in freight transportation



...among others



ENERGY

We believe a sustainable system of energy production is rooted in:



Reliable and cost-competitive wind power



Efficient and scalable solar power



Substantial storage capacity for all renewables



Innovations in off-grid global energy access



Positive associated implications for human capital



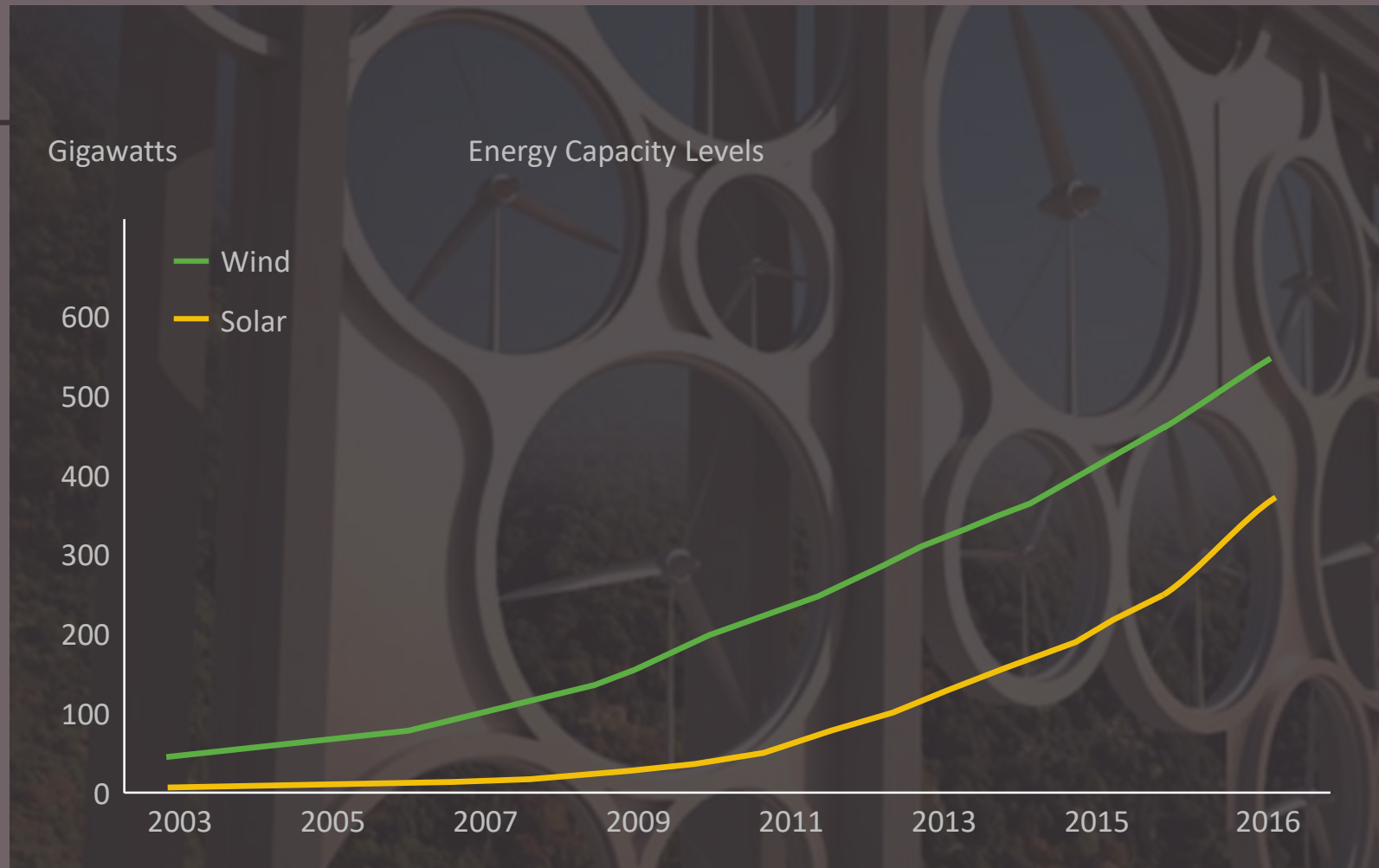
A united global commitment to responsible investment



An effective price on carbon for industry and governments

Despite its maturity relative to other renewables, global wind capacity continues to grow at double-digit rates annually

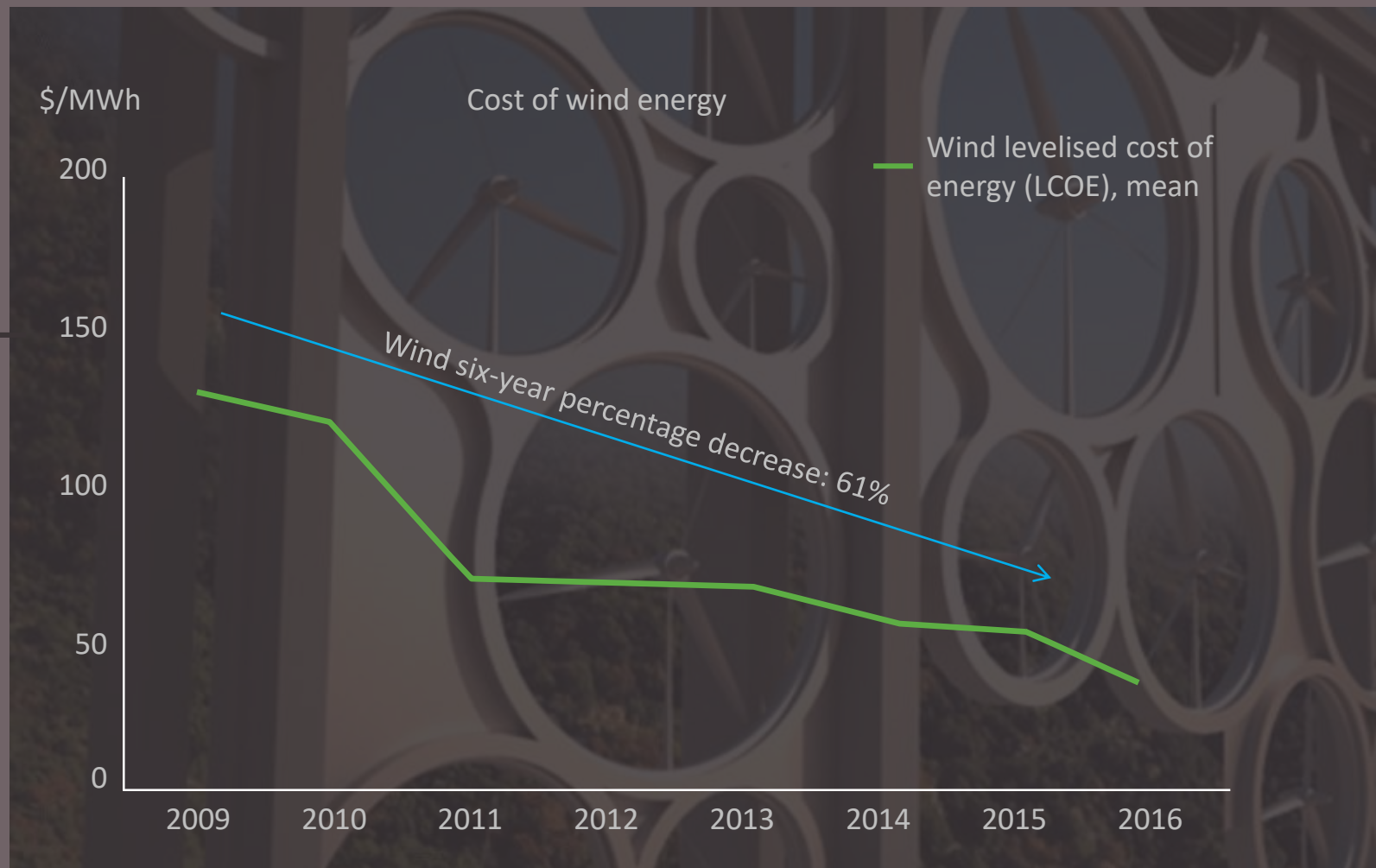
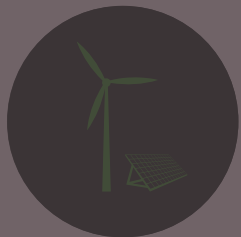
The wind market is more mature than the solar market: wind's capacity levels in 2003 were only matched by solar in 2011



Source: REN21, European Photovoltaic Industry Association, BP Statistical Review of World Energy 2017 Note: Projections based on EPIA medium scenario

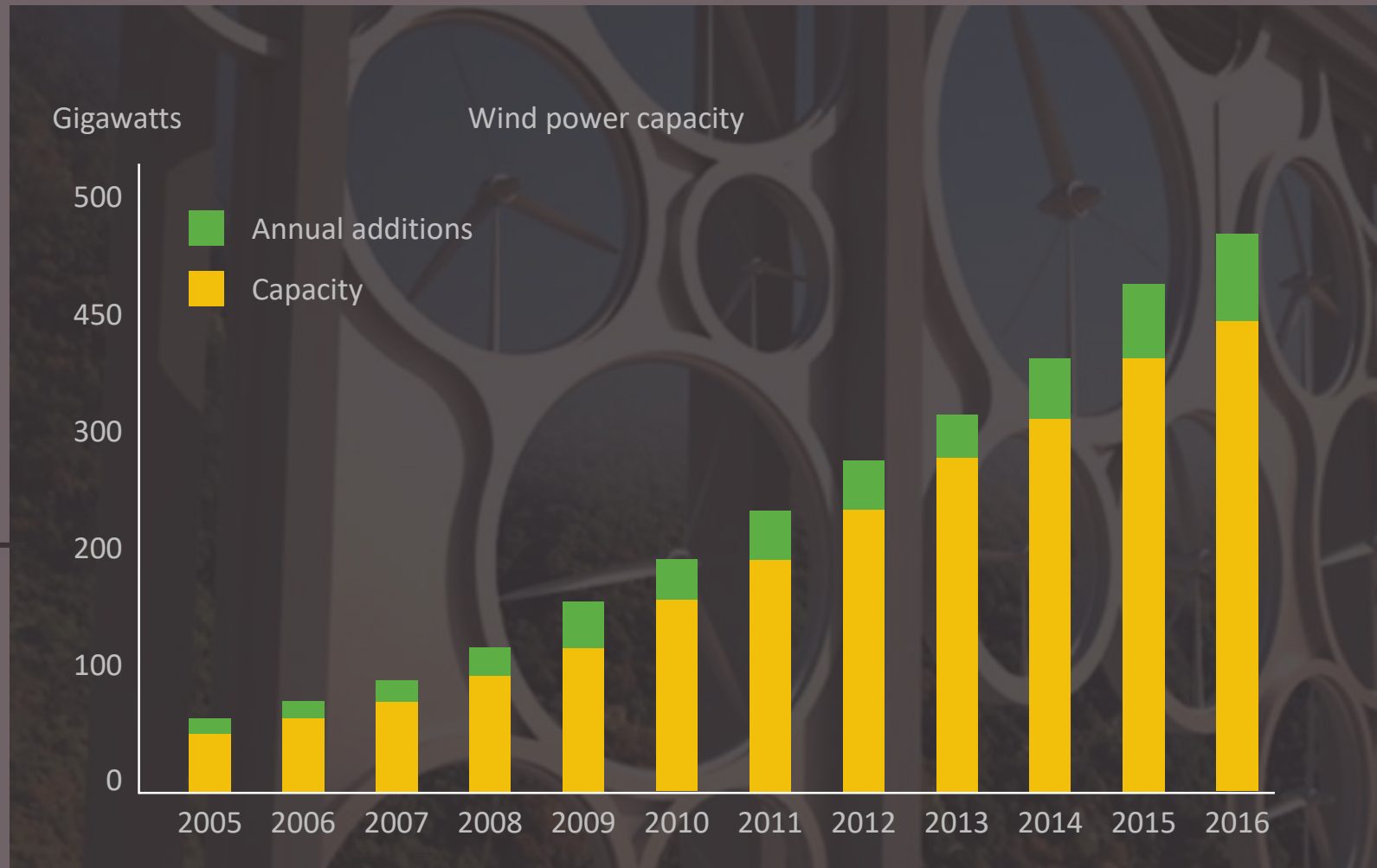
Despite its maturity relative to other renewables, global wind capacity continues to grow at double-digit rates annually

The cost of wind energy continues to decrease due to cheaper components and significant efficiency improvements



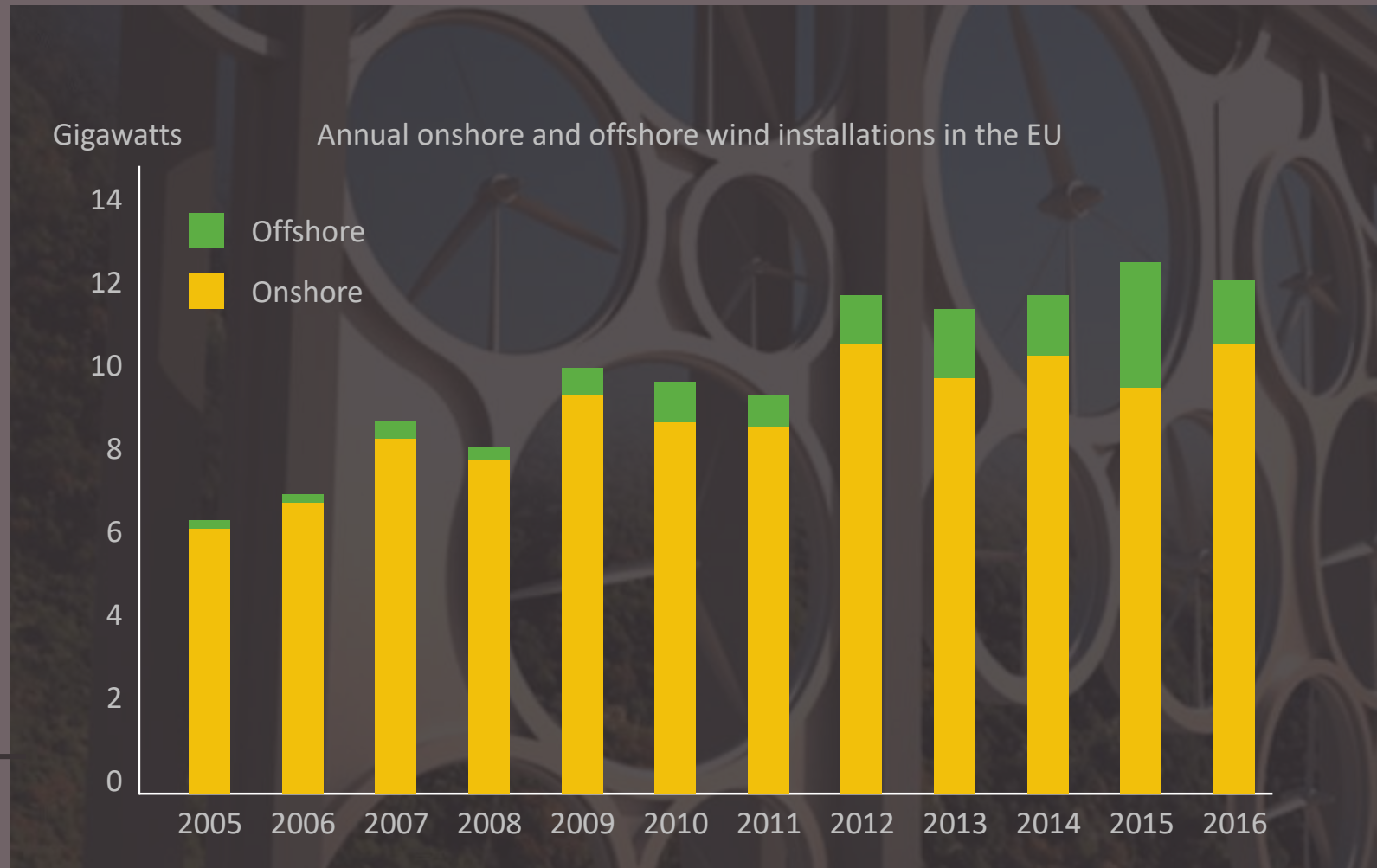
Despite its maturity relative to other renewables, global wind capacity continues to grow at double-digit rates annually

As a result, wind power continues to see year-on-year capacity growth, including a 12.5% increase between 2015 and 2016



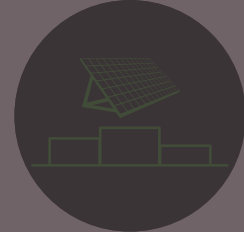
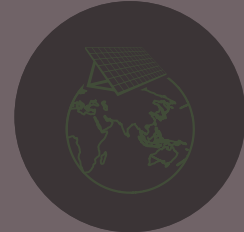
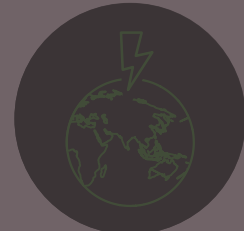
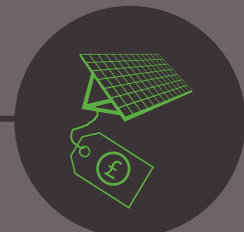
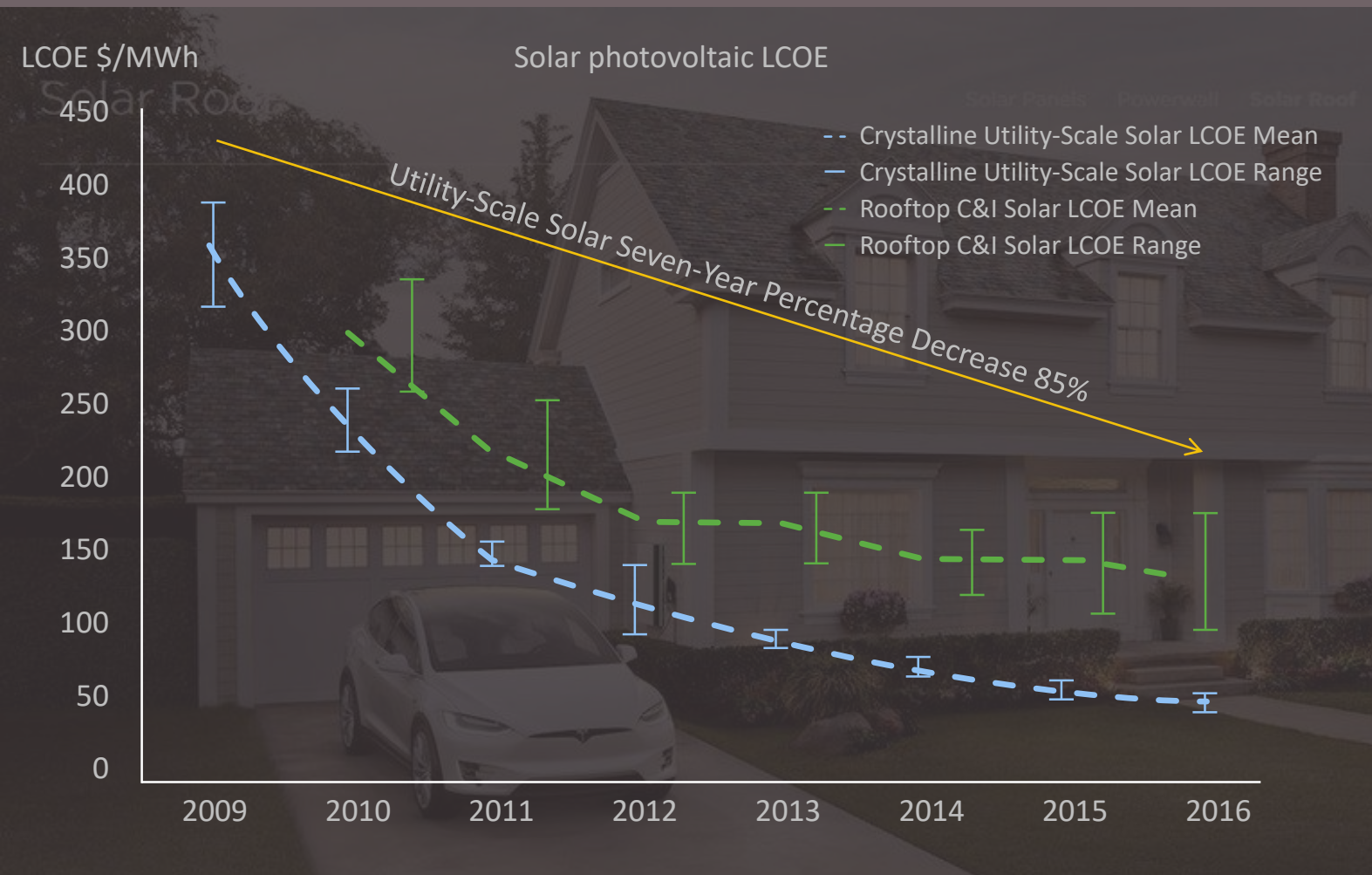
Despite its maturity relative to other renewables, global wind capacity continues to grow at double-digit rates annually

Offshore installations have been an increasing contributor, especially in Europe



Installed capacity of solar energy has grown at a 50% CAGR* over the last eight years

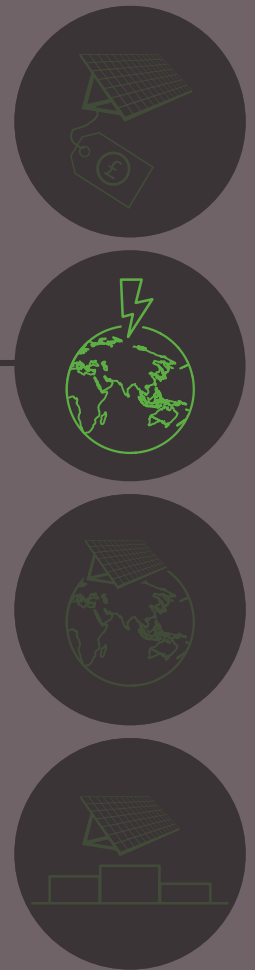
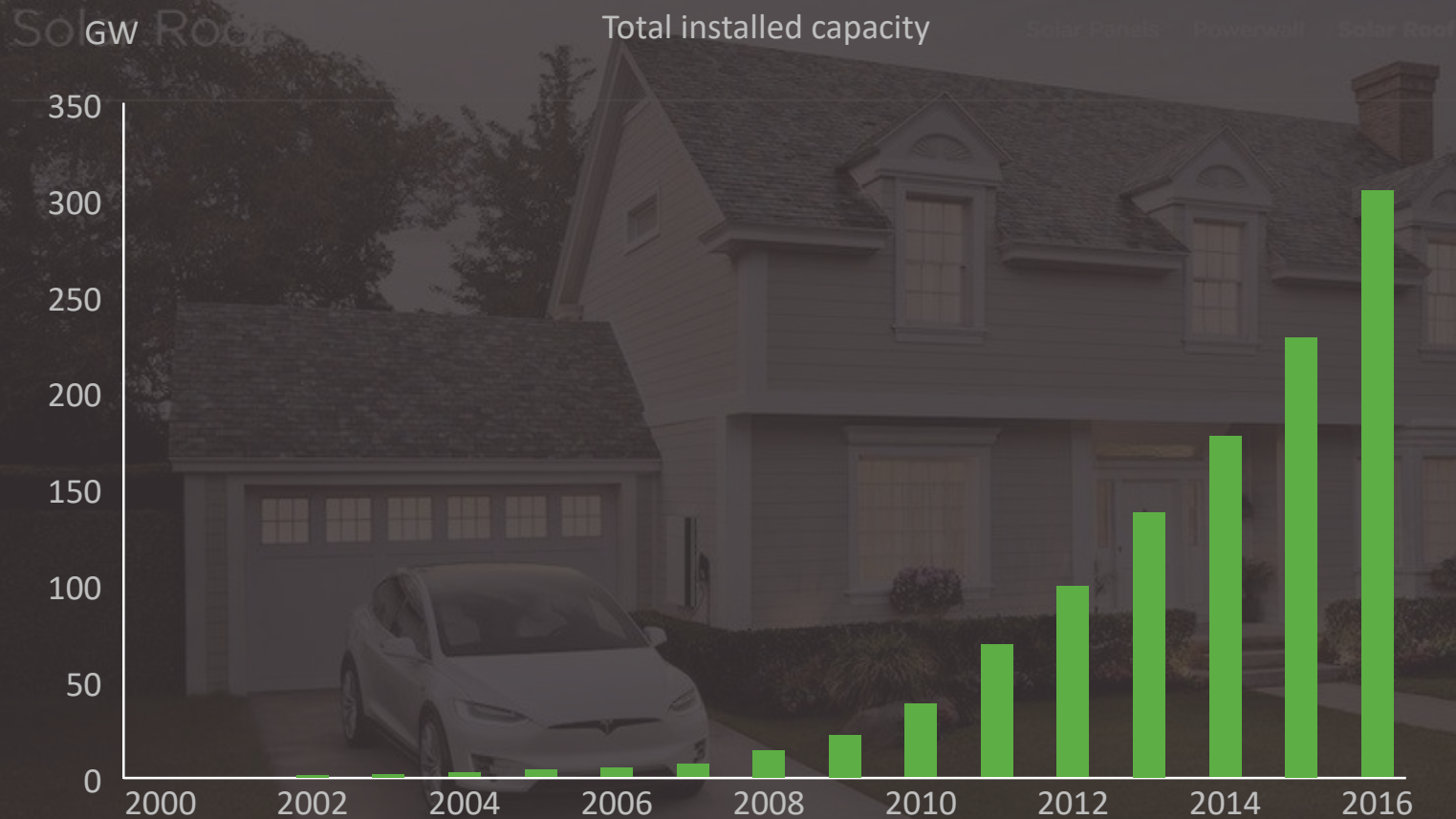
The cost of solar continues to decline as production volumes increase: cost is no longer the major barrier to growth



Source: Lazard *Note: Compound annual growth rate (CAGR) is a measure of growth over multiple time periods

Installed capacity of solar energy has grown at a 50% CAGR* over the last eight years

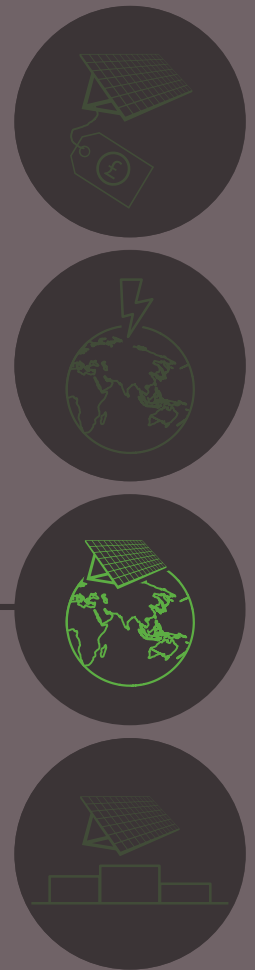
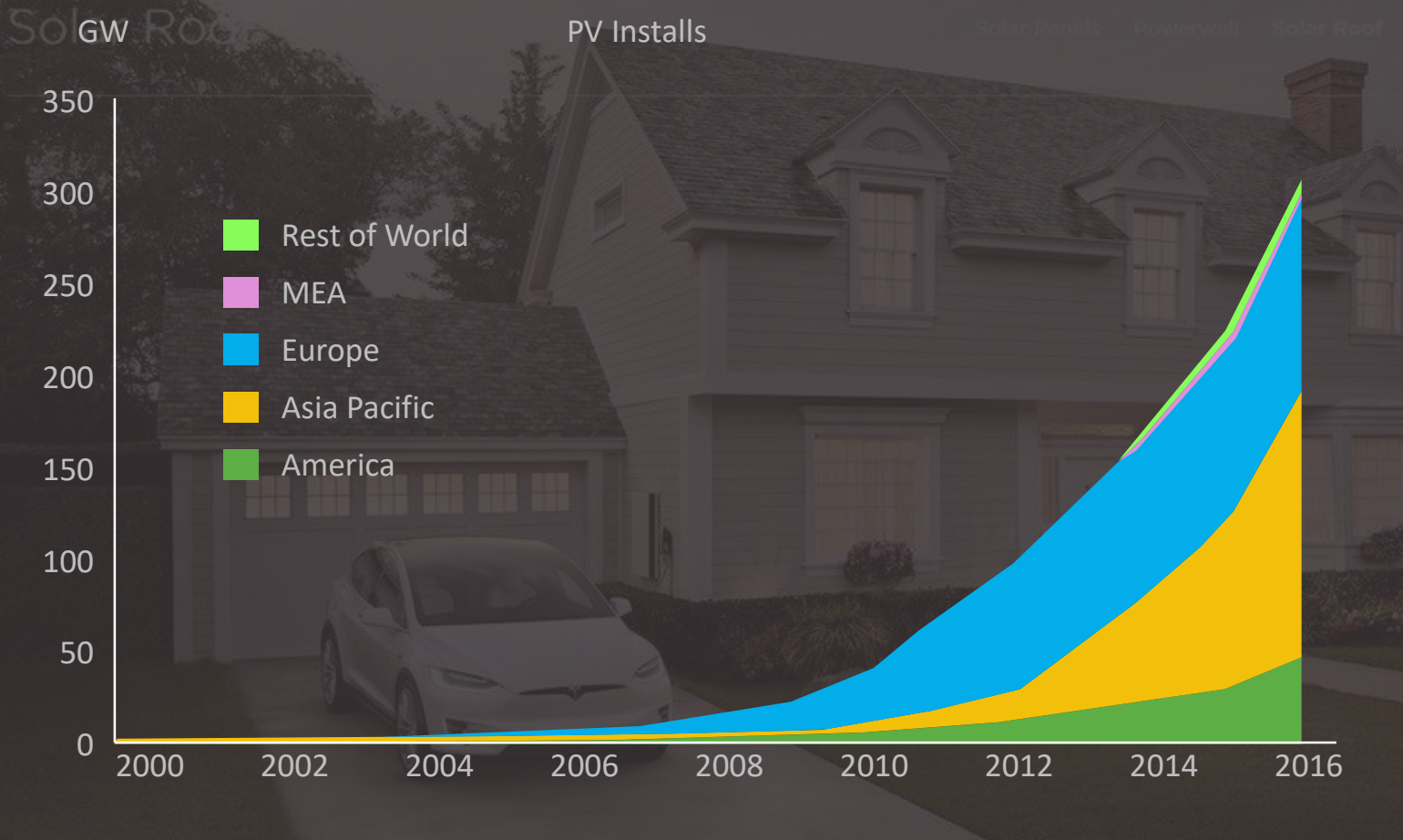
The total installed capacity at the end of 2016 amounted to more than 300 GW globally



Source: IEA 2016 Snapshot of Global Photovoltaic Markets *Note: Compound annual growth rate (CAGR) is a measure of growth over multiple time periods

Installed capacity of solar energy has grown at a 50% CAGR* over the last eight years

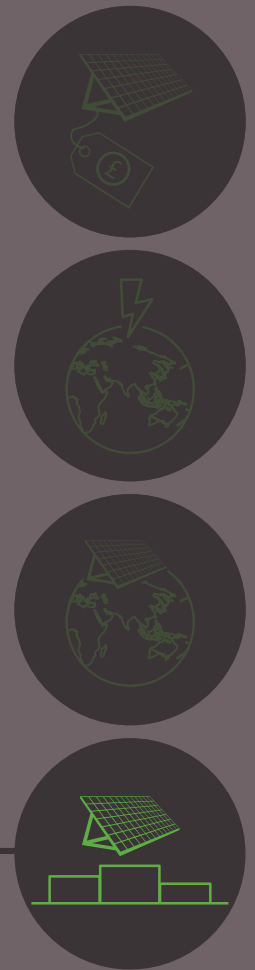
This is due in part to substantial growth in PV installations in Asia



Source: IEA 2016 Snapshot of Global Photovoltaic Markets *Note: Compound annual growth rate (CAGR) is a measure of growth over multiple time periods

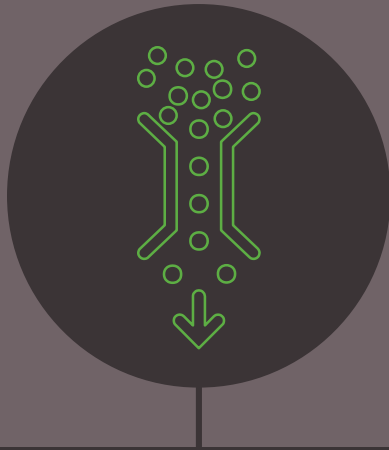
Installed capacity of solar energy has grown at a 50% CAGR* over the last eight years

Today, we are at an inflection point where solar is competitive without subsidies



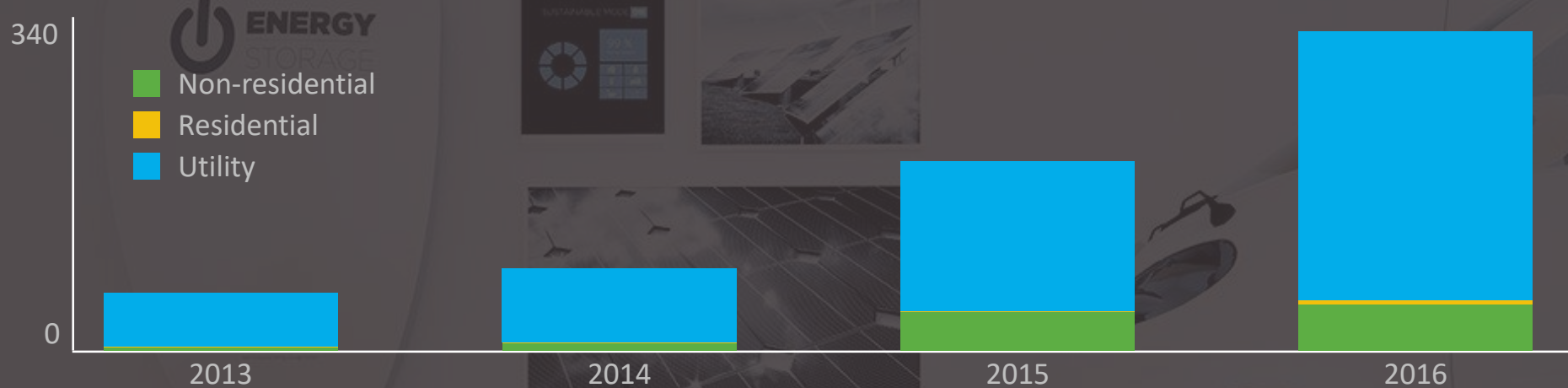
Source: Lazard 2016 *Note: Compound annual growth rate (CAGR) is a measure of growth over multiple time periods

The cost of storage is generally a bigger bottleneck than the cost of production, but capacity is growing and costs are declining

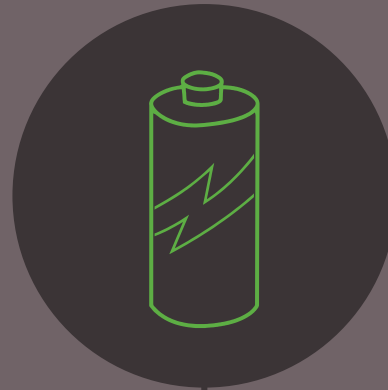


The energy-storage industry is rapidly innovating, with 2016 exhibiting significant growth

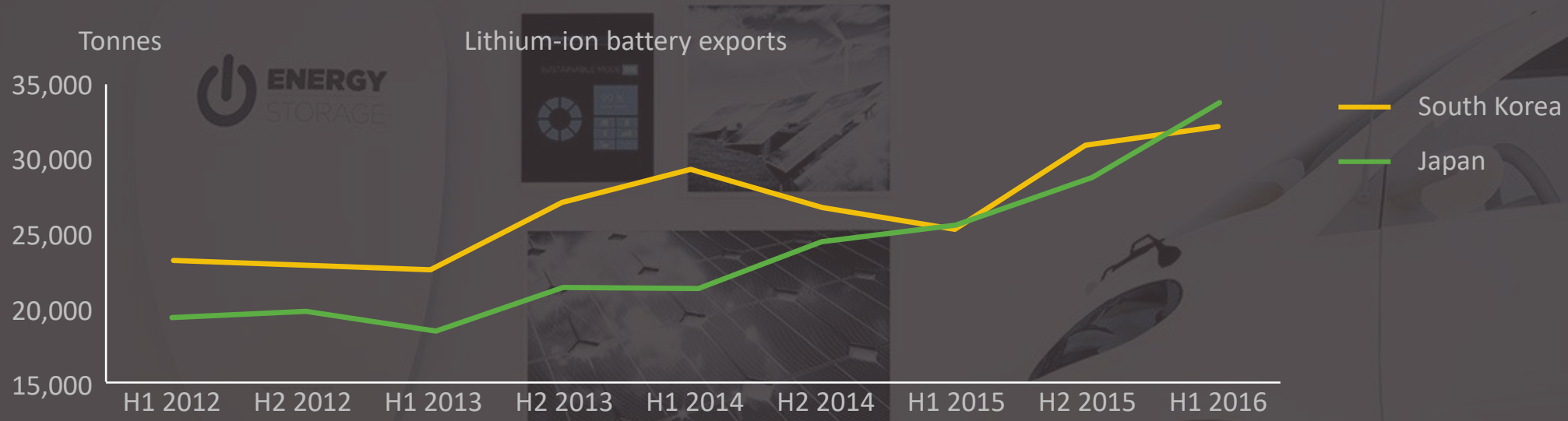
US energy storage deployments (MWh)



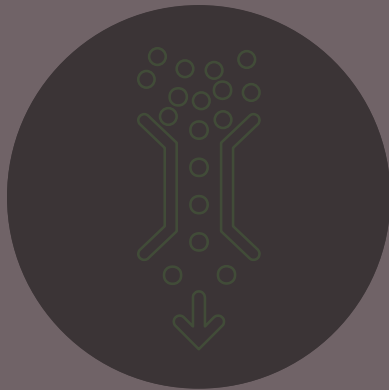
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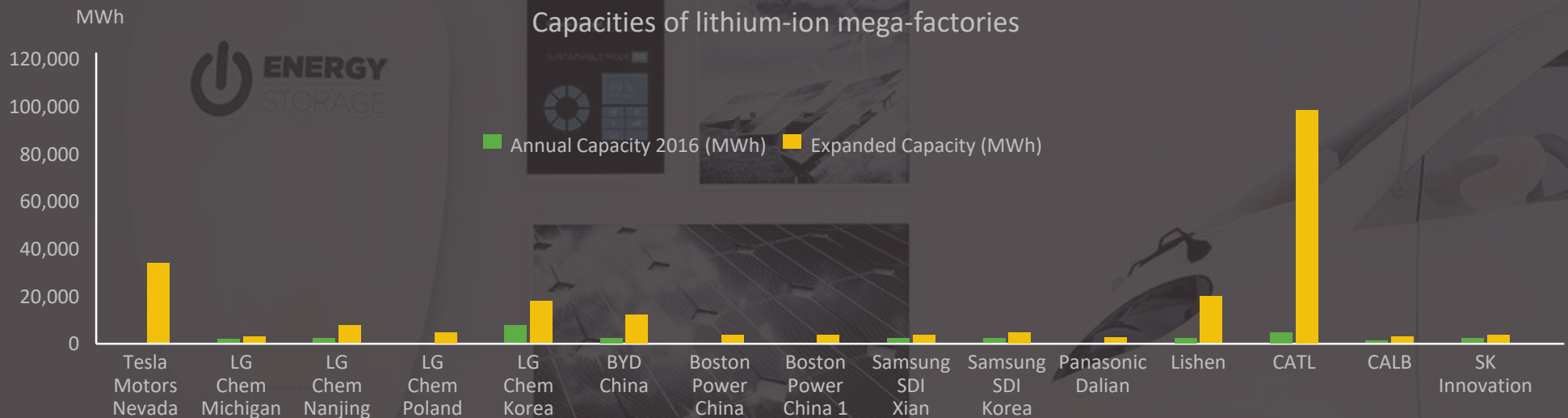
The global lithium market continues to grow as lithium-ion battery exports see new heights



The cost of storage is generally a bigger bottleneck than the cost of production, but capacity is growing and costs are declining

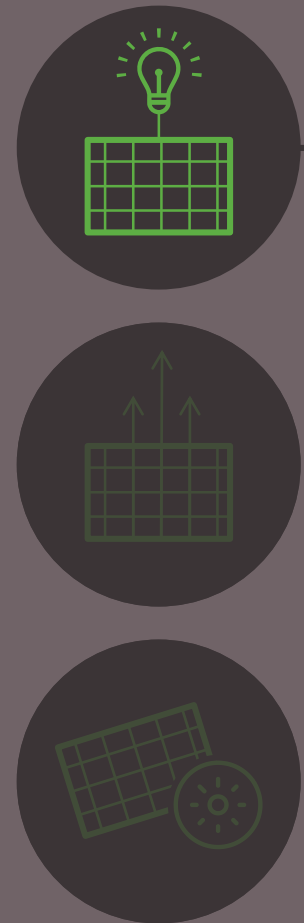


And lithium-ion mega-factories continue to increase capacity worldwide



Lower costs mean renewable technologies are becoming increasingly affordable in emerging markets

The number of known pico-solar* manufacturers continue to grow with new financing schemes emerging

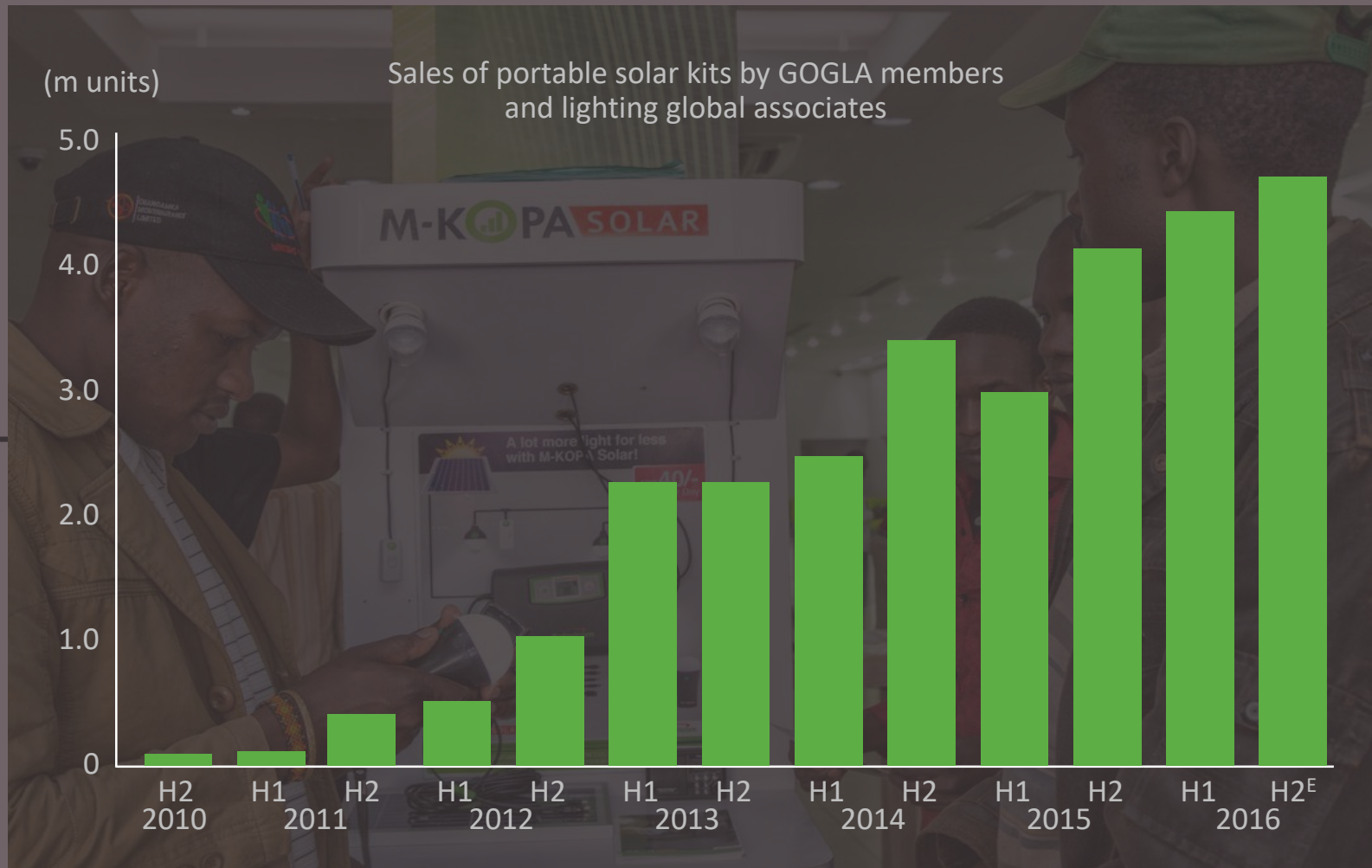
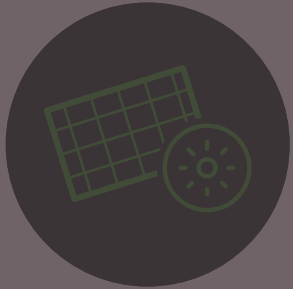


Source: BNEF; Dalberg; Lighting Global *Note: pico-solar systems are smaller and cheaper than conventional solar systems, but can provide energy for low-power gadgets, such as cell phones

© Generation Investment Management LLP

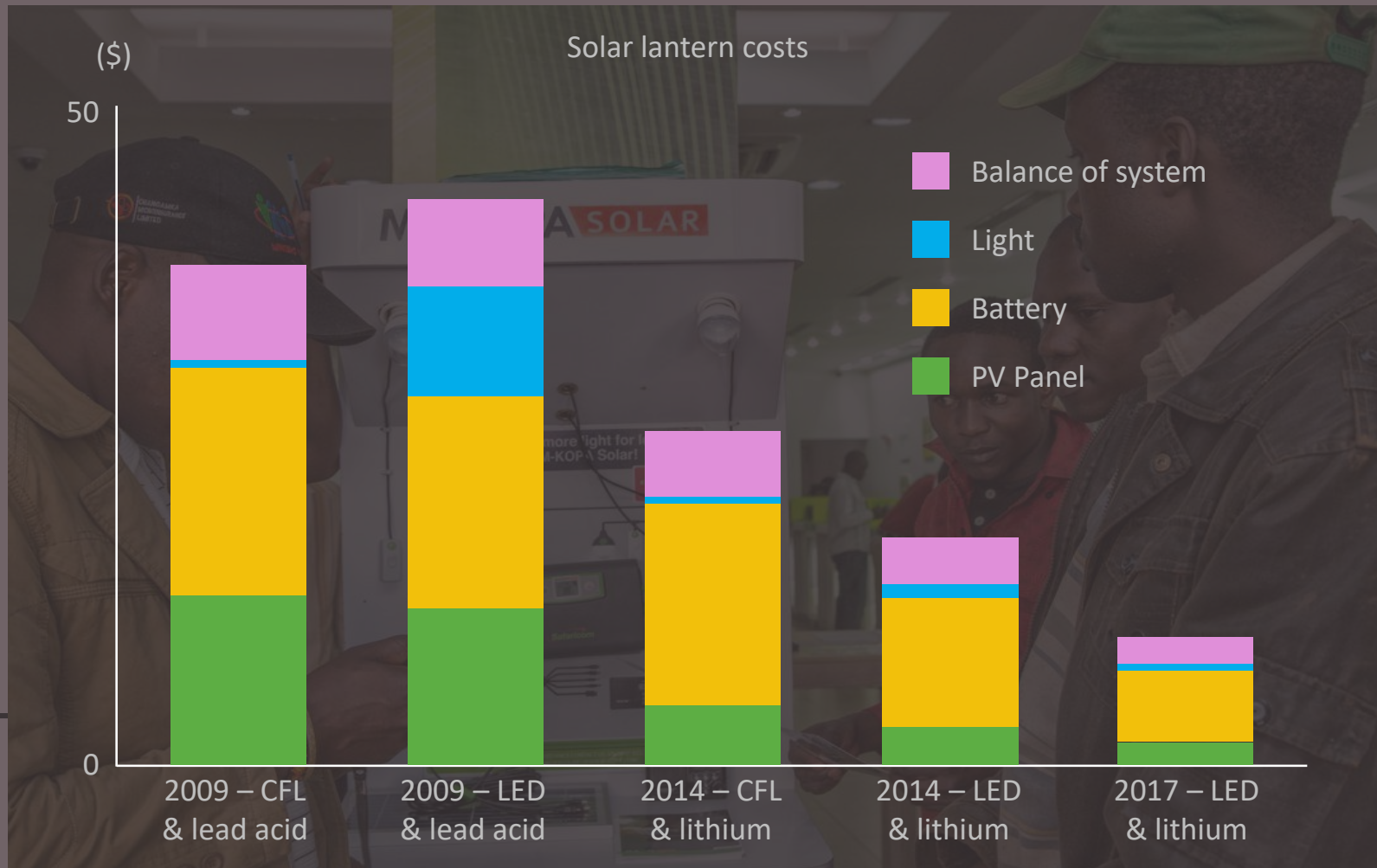
Lower costs mean renewable technologies are becoming increasingly affordable in emerging markets

The off-grid renewables market continues to penetrate a space previously dominated by unsustainable and dangerous energy sources



Lower costs mean renewable technologies are becoming increasingly affordable in emerging markets

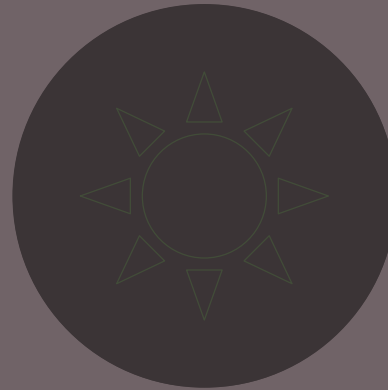
Solar lanterns are becoming cheaper due to decreasing energy and storage costs



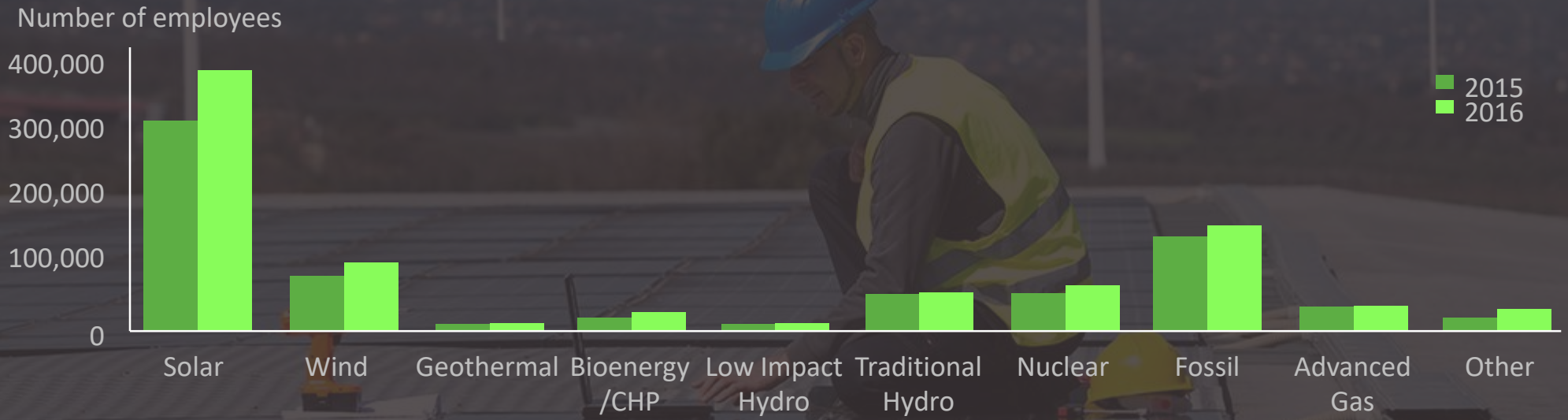
Source: Lawrence Berkeley National Laboratory, BNEF

50

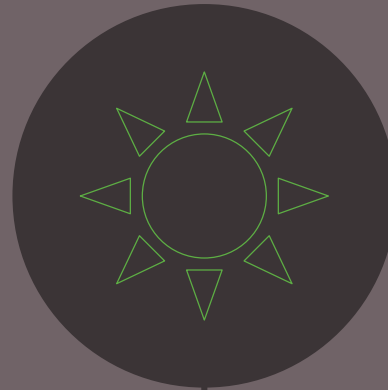
Renewable energy also represents significant employment potential



Solar now employs more people in US electricity generation than oil, coal and gas combined

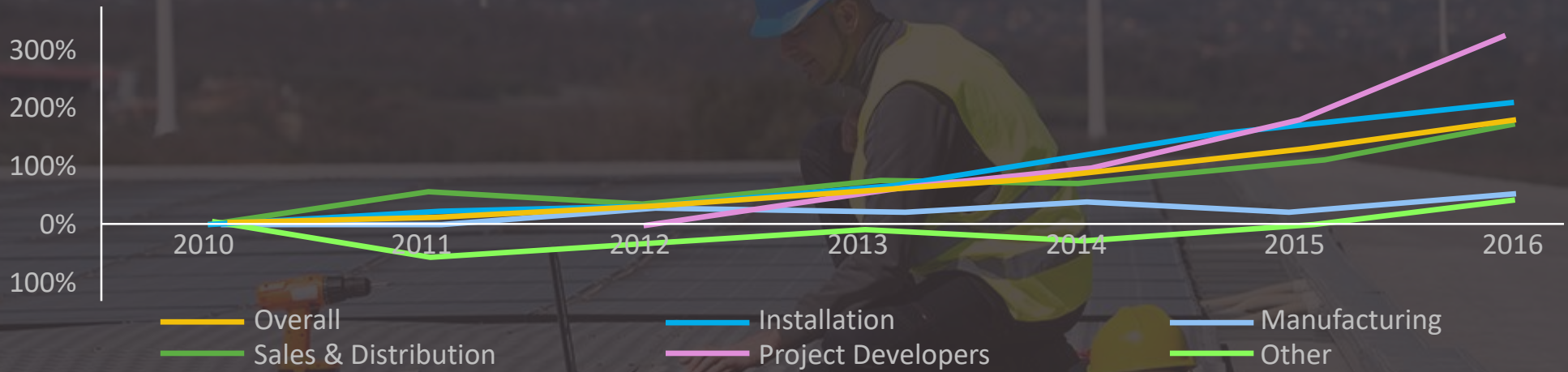


Renewable energy also represents significant employment potential

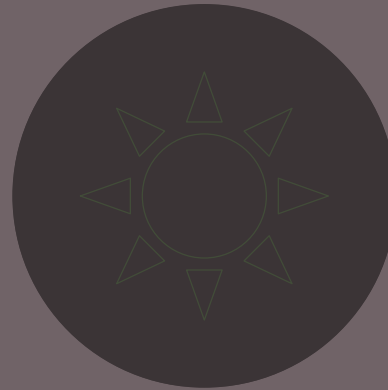


There has been strong growth in employment figures, which are increasing across all segments of the US solar industry

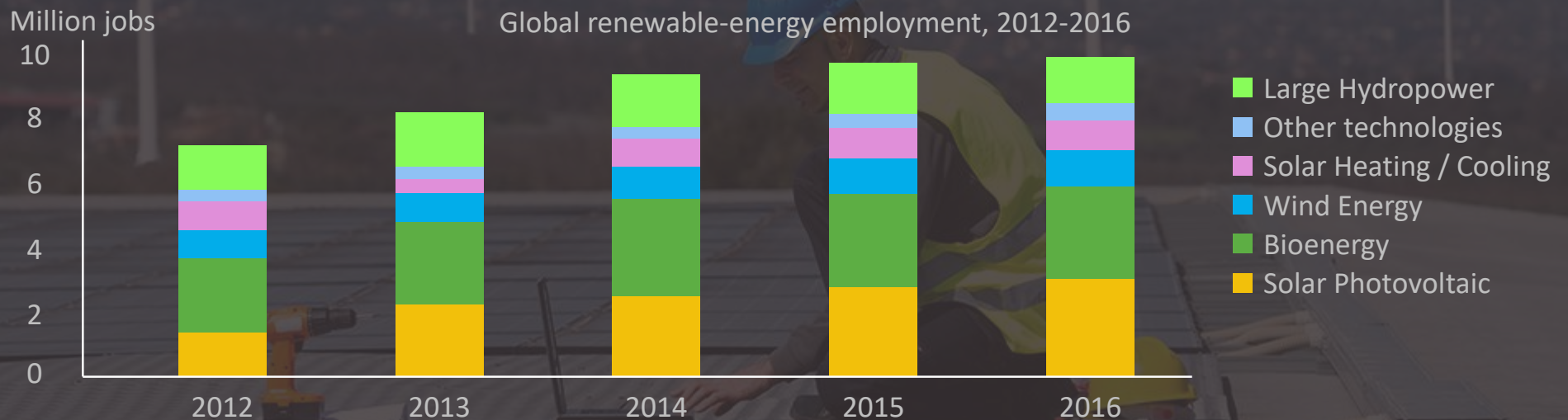
US solar employment growth (%)



Renewable energy also represents significant employment potential



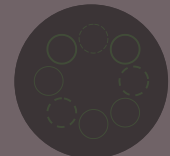
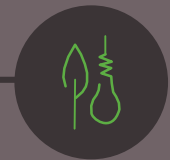
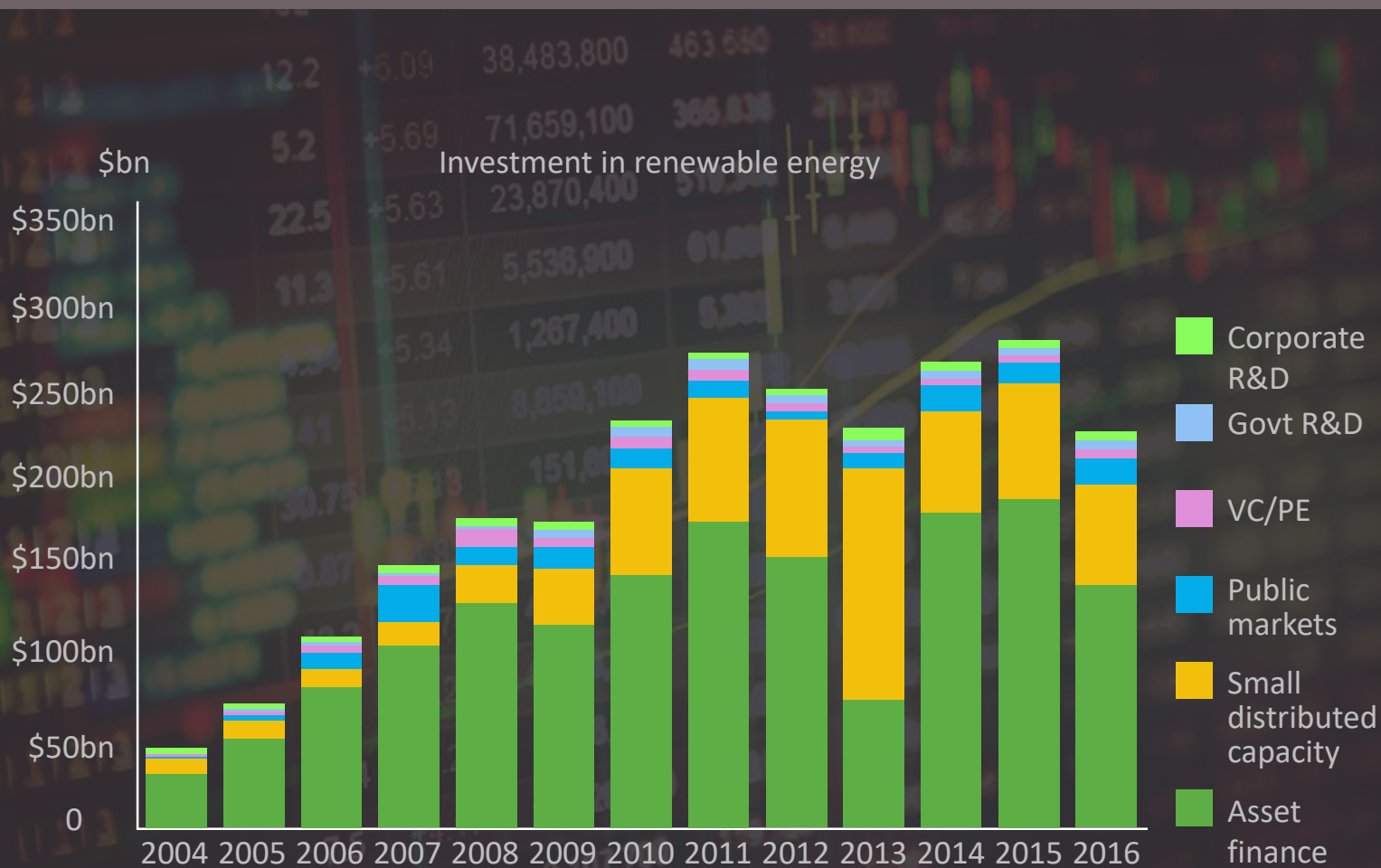
An upsurge in employment in renewable energy is also holding true on a global scale



Source: International Renewable Energy Agency, 2017

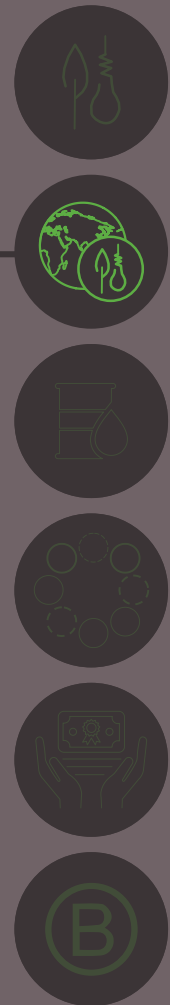
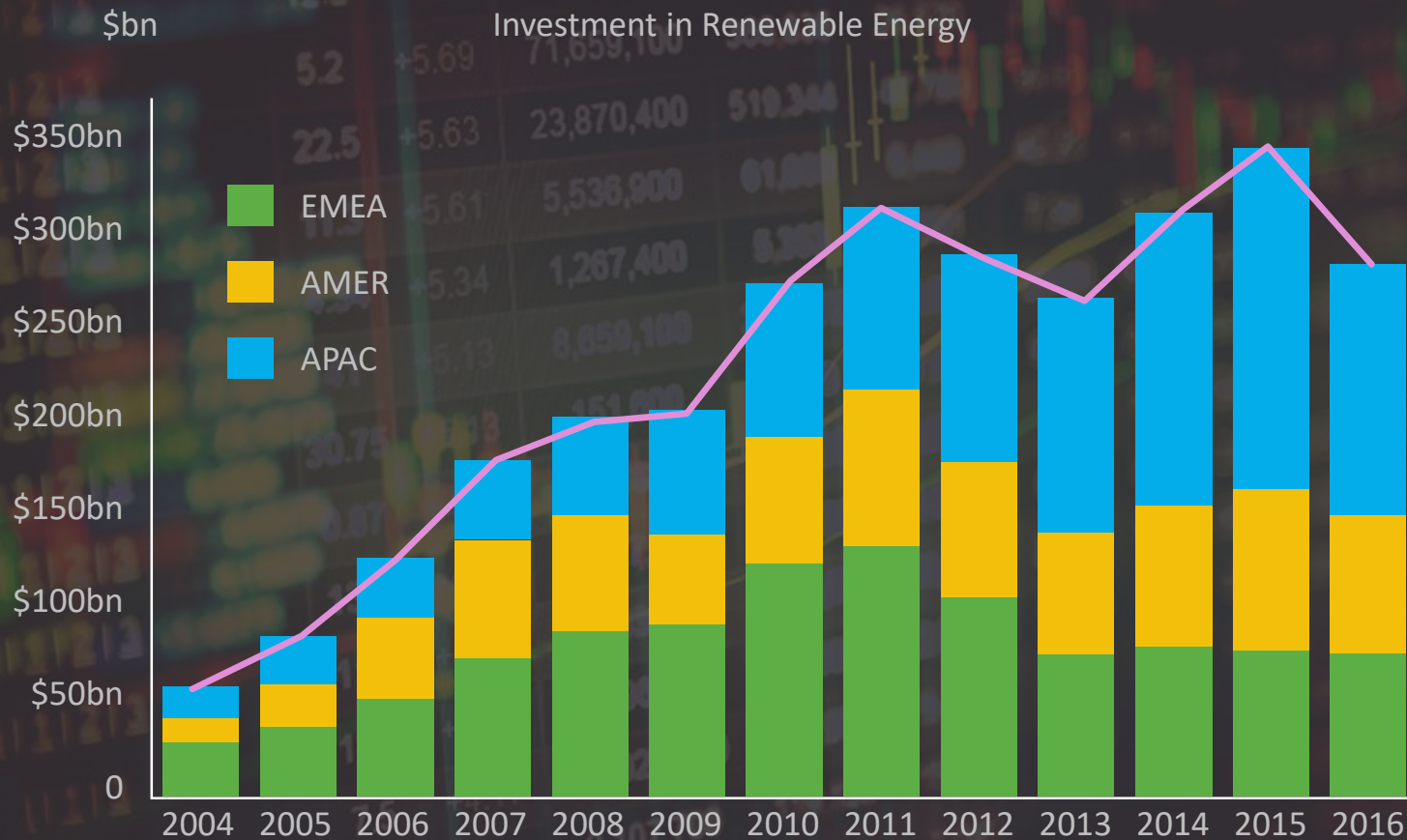
Capital continues to flow to clean energy and broader sustainability-oriented projects

New investment in renewable energy is seen across asset classes...



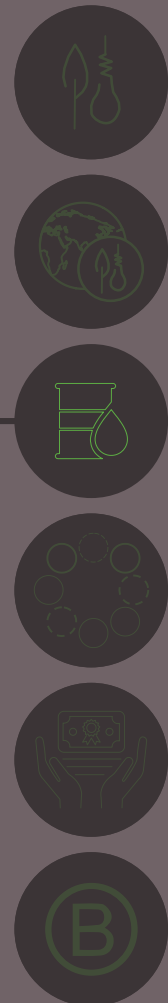
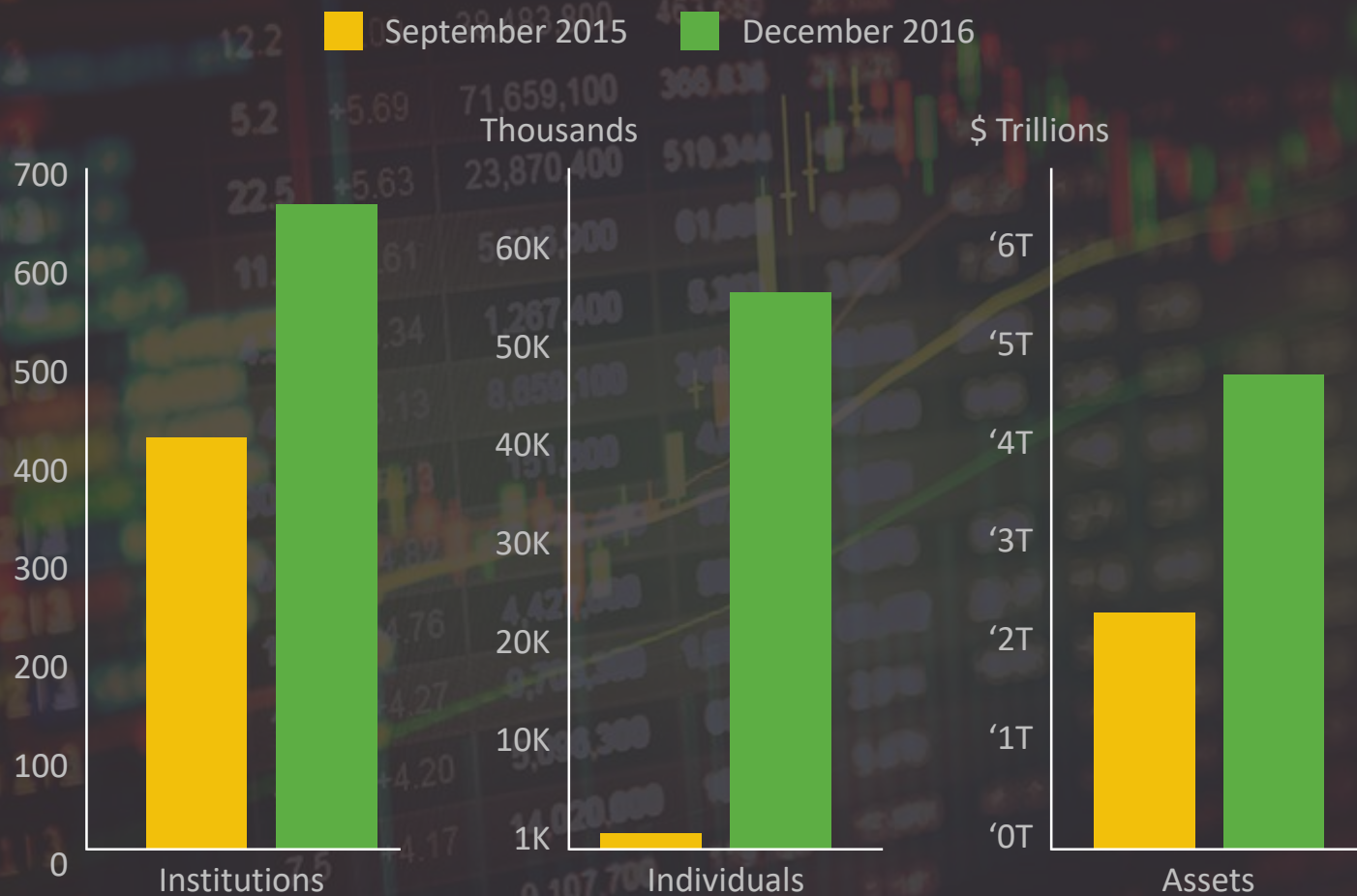
Capital continues to flow to clean energy and broader sustainability-oriented projects

...and across regions



Capital continues to flow to clean energy and broader sustainability-oriented projects

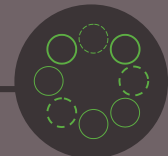
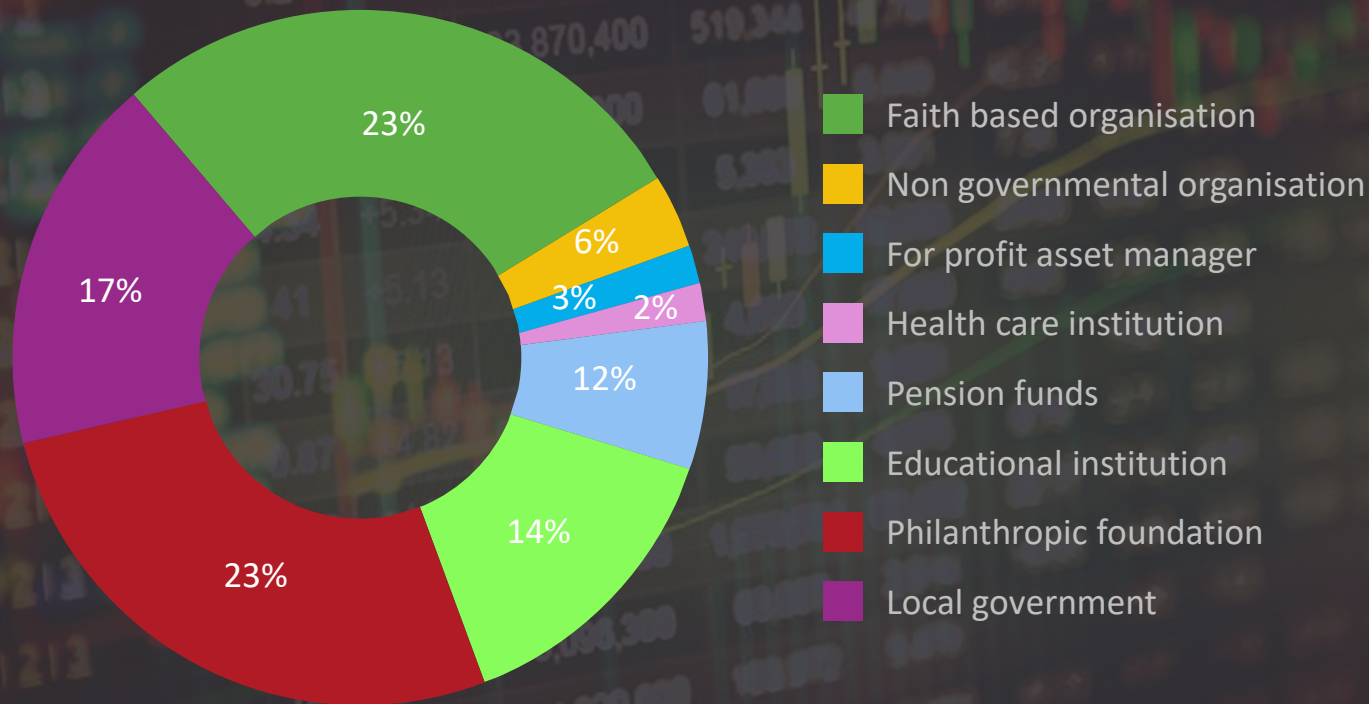
The movement towards divestment of fossil fuels is growing quickly...



Capital continues to flow to clean energy and broader sustainability-oriented projects

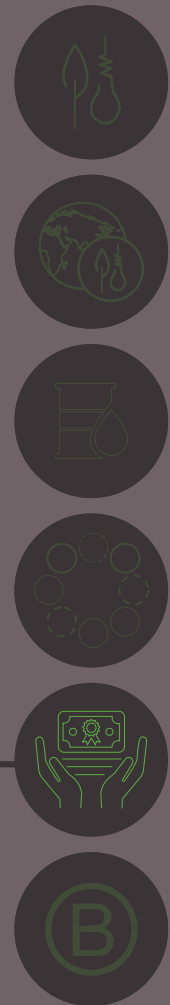
...while divesting institutions are more diverse

Proportion of commitment to total divestment amount by type of institution, US



Capital continues to flow to clean energy and broader sustainability-oriented projects

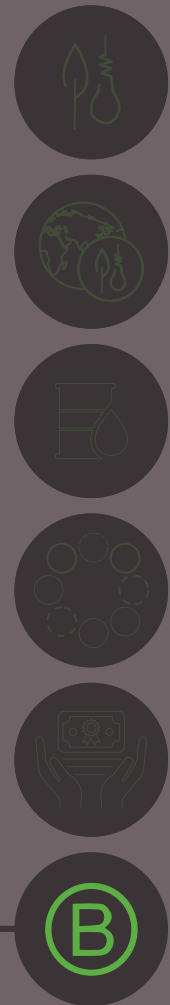
The green-bond market has also taken off



Capital continues to flow to clean energy and broader sustainability-oriented projects

Global companies committed to solving social and environmental problems are certifying as “B Corporations”

Number of Certified B Corporations

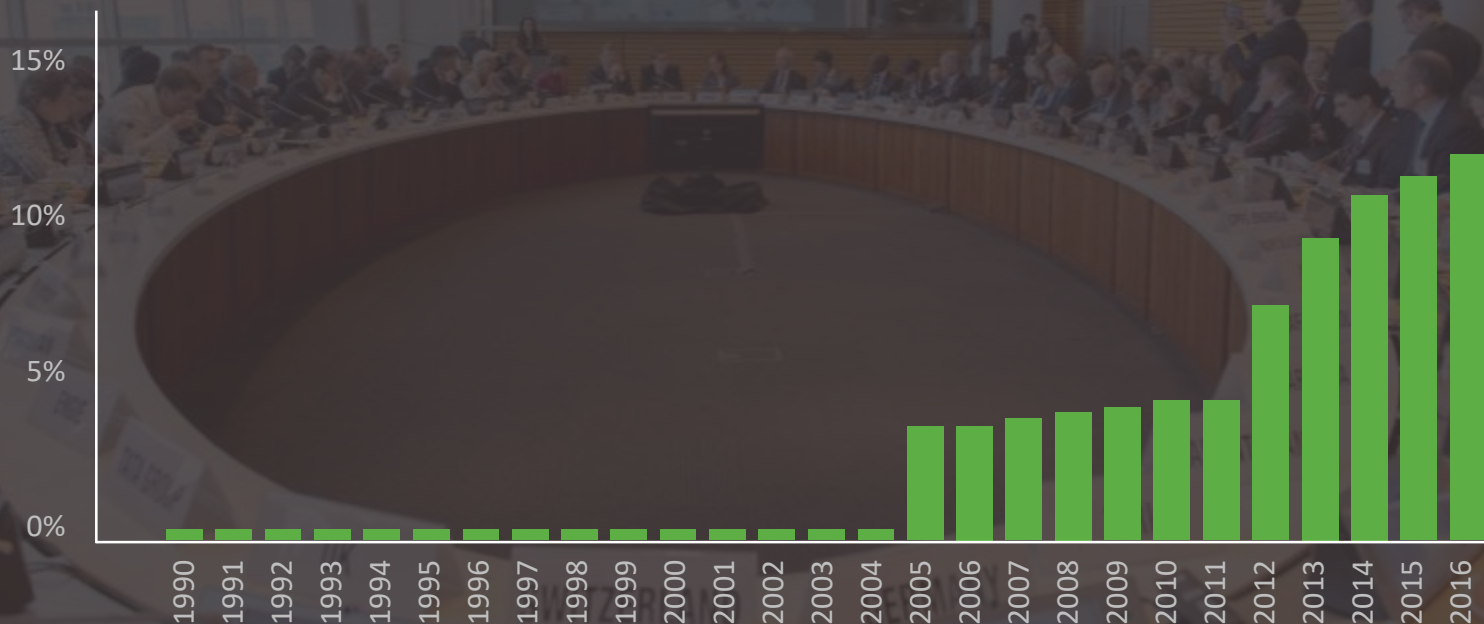


Traction towards decarbonisation is evidenced in pervasive support for carbon pricing

While the range of national carbon prices is broad, the share of global greenhouse gas emissions covered by pricing initiatives continues to expand

Regional national and subnational carbon pricing initiatives:
share of global GHG emissions covered

Share of global
GHG emissions



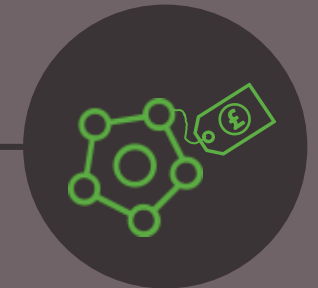
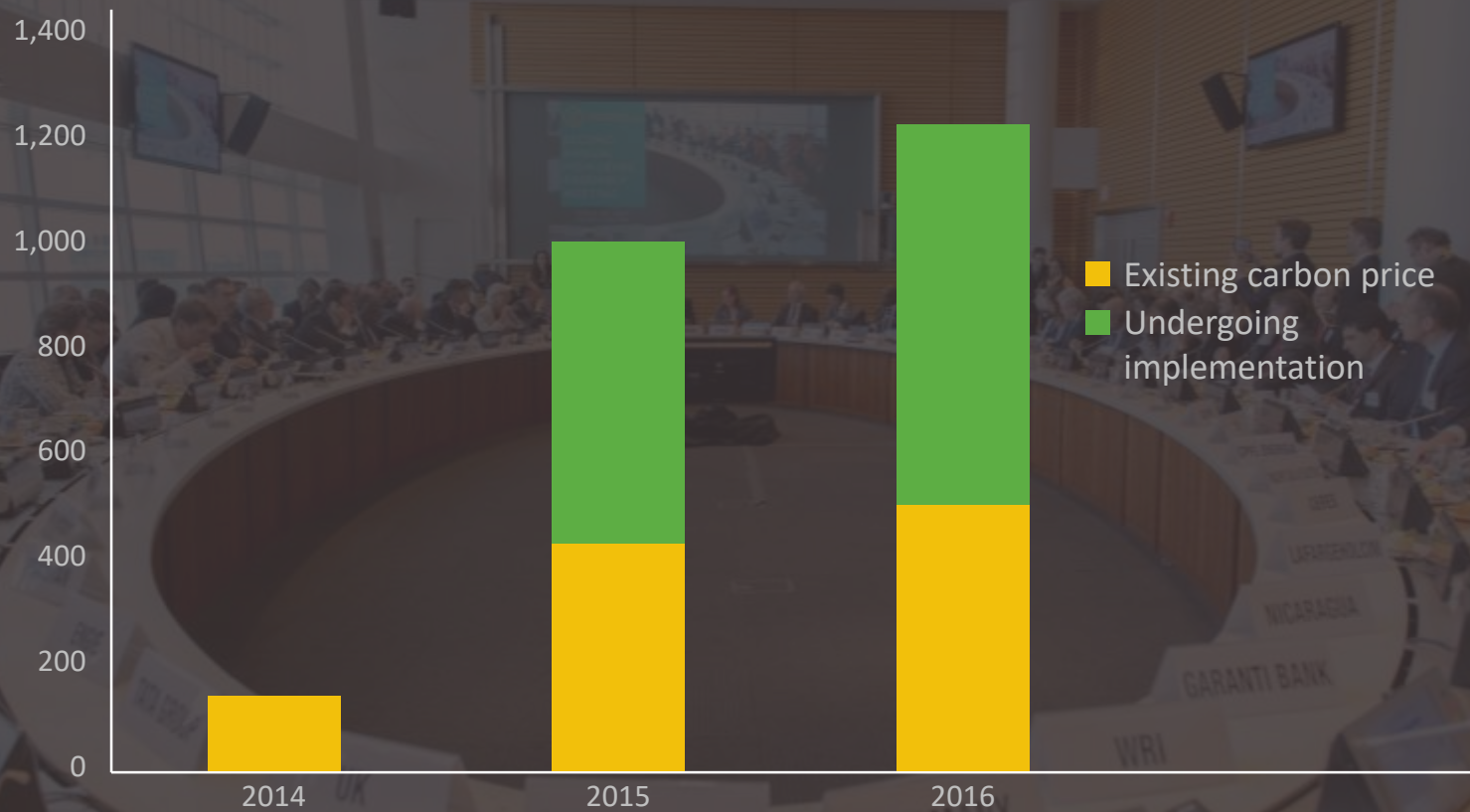
Source: World Bank Group, Ecofys, VividEconomics



Traction towards decarbonisation is evidenced in pervasive support for carbon pricing

This trend is also true across the corporate world, where commitment to an internal price on carbon has increased more than threefold since 2014

Number of corporates reporting use of an internal carbon price

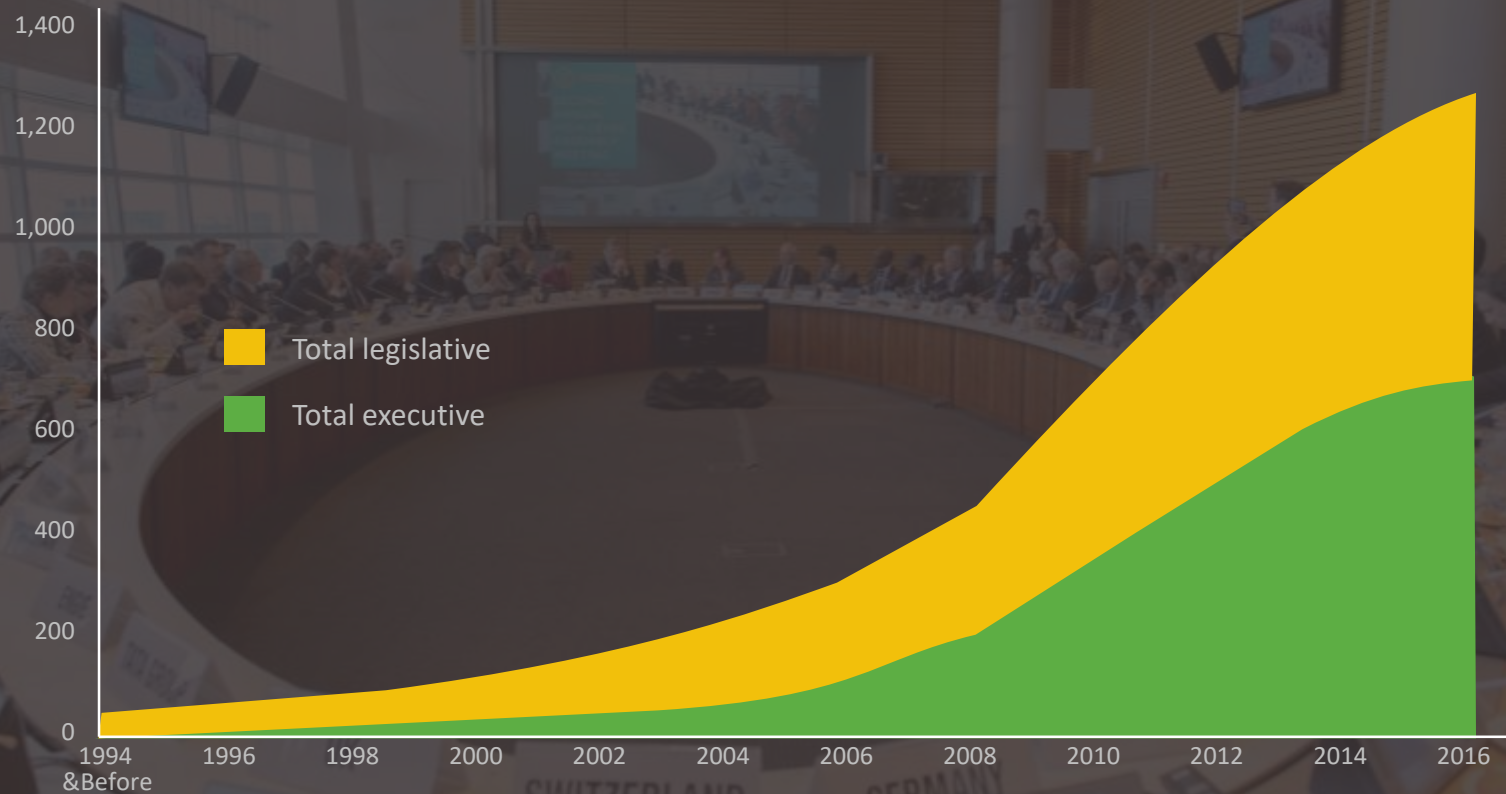


Traction towards decarbonisation is evidenced in pervasive support for carbon pricing

Regulatory tailwinds are further demonstrated by growth in the global stock of climate legislation, which stands at over 1,200 laws across 164 countries

Total laws and executive policies

Legislative and Executive Acts up to 2016



Source: Climate Change Laws of the World

Energy trends to monitor:



The contribution of renewables to total energy consumption, which sat at just over 5% in 2016 (source: IEA)



Adherence to global renewable policy commitments, including Paris COP21, and a movement towards a global price on carbon



Cybersecurity solutions to enable resilient energy networks



Reduction in habitat-destruction risk of certain renewable infrastructure

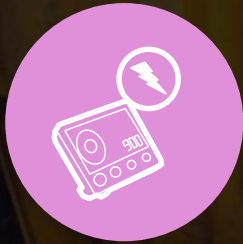


...among others



BUILT ENVIRONMENT

We believe a sustainable built environment is characterised by:



A physical world that is enabled and optimised through digitisation



Materials and infrastructure that consume minimal amounts of energy



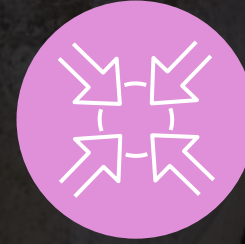
Significant capital commitments to efficiency efforts by both the public and private sector



A functioning circular economy enabling better use of materials



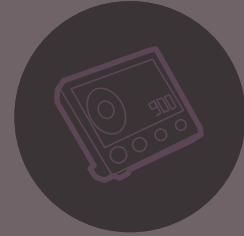
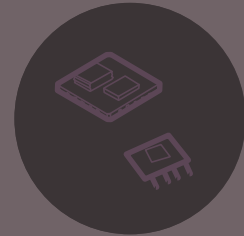
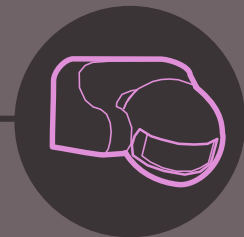
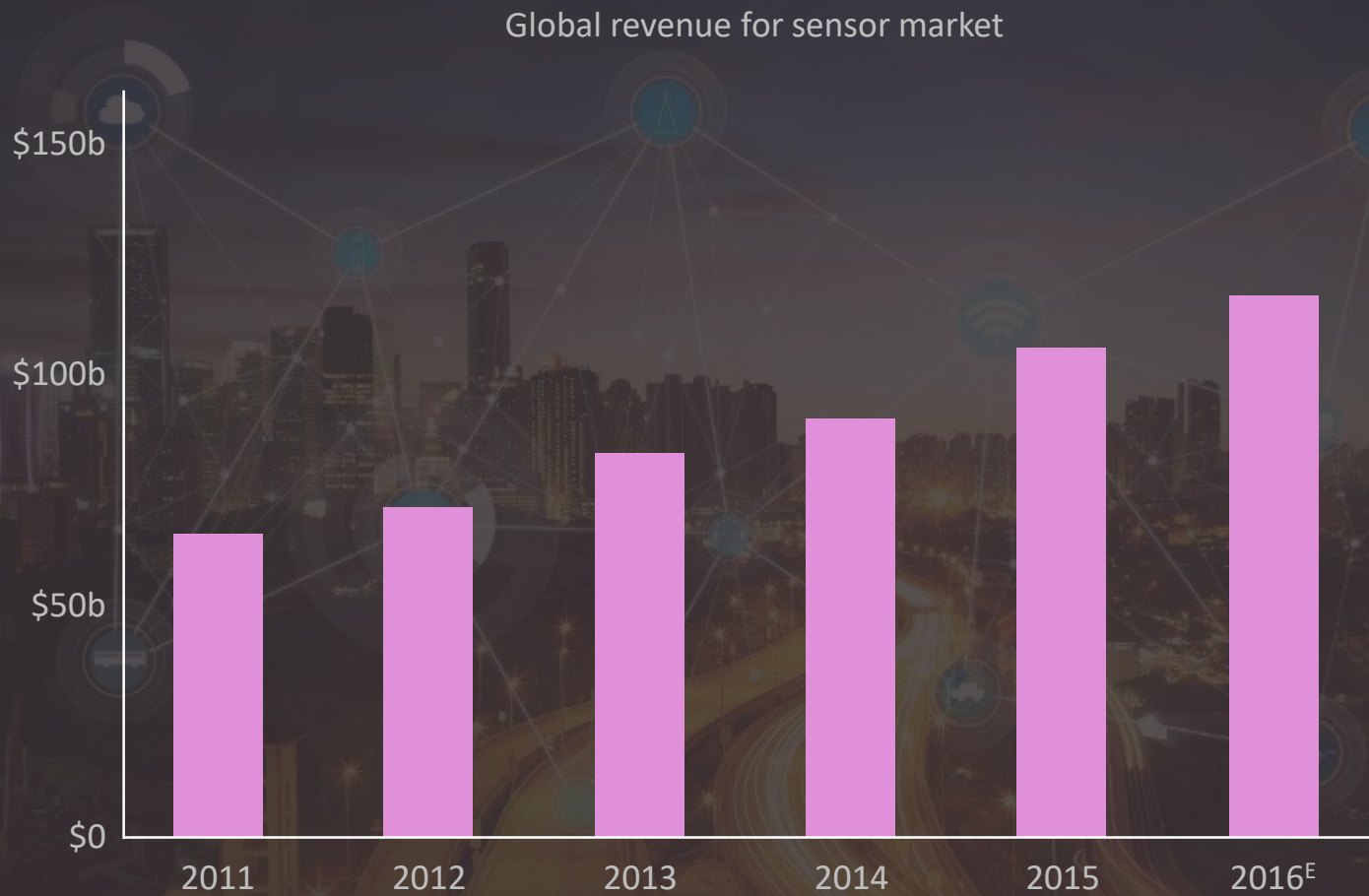
Affordable industrial appliances that offer a superior return on investment to the consumer



A sharing economy which paves the way for improved fixed asset utilisation

The physical world is becoming ever more connected to the digital world

The global sensor market has been growing over the past few years

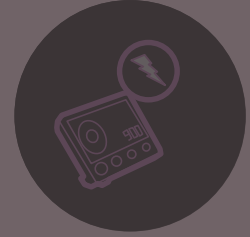
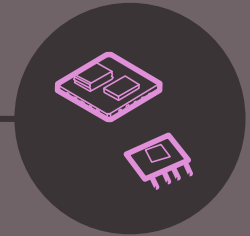
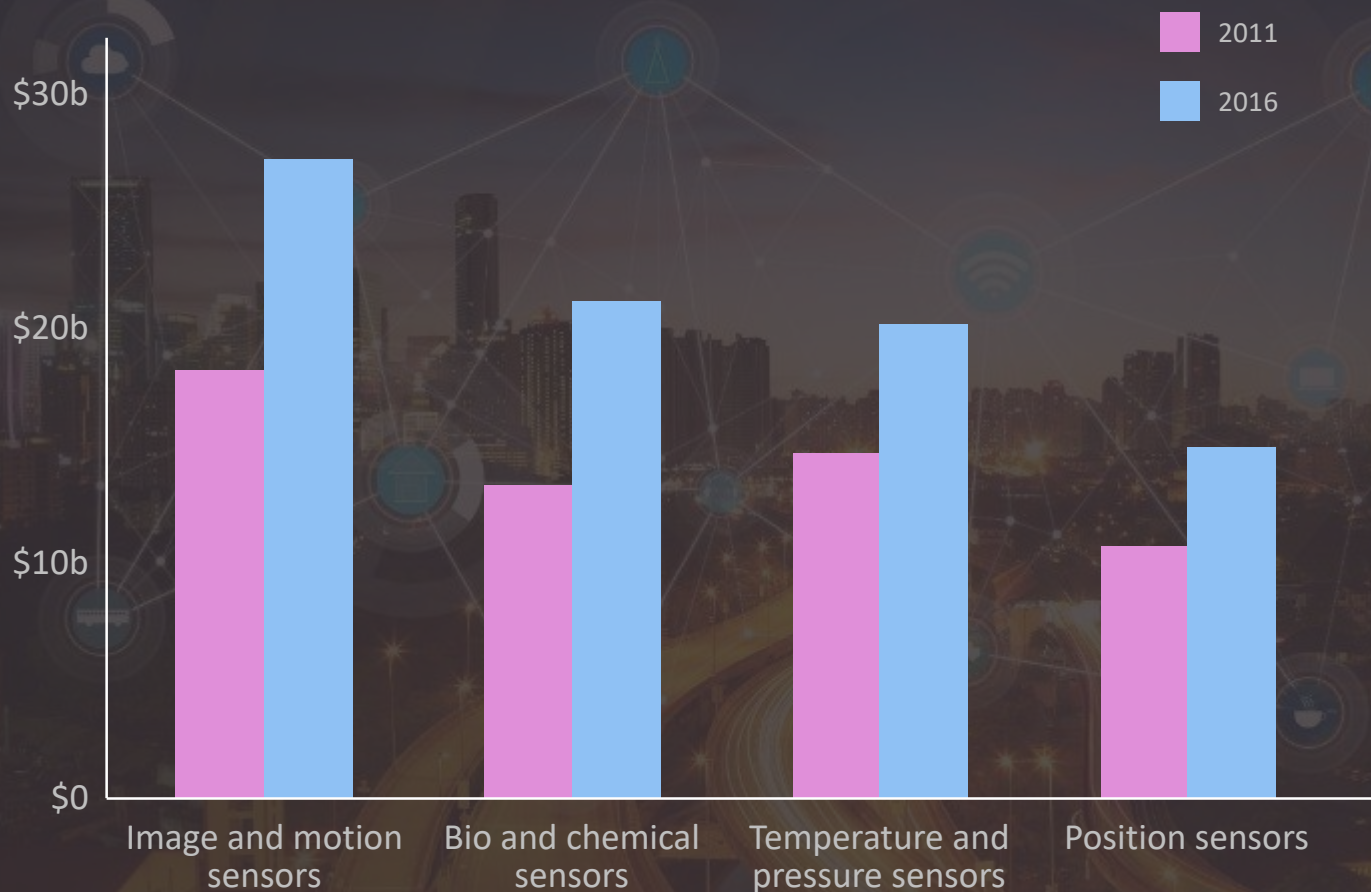


Source: BCC Research, Global Markets and Technologies for sensors

The physical world is becoming ever more connected to the digital world

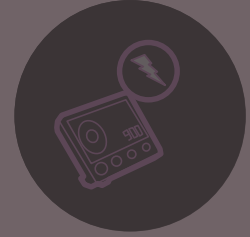
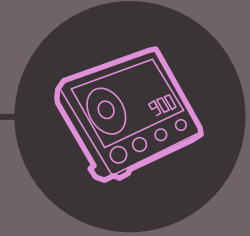
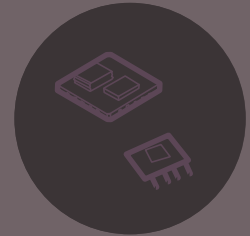
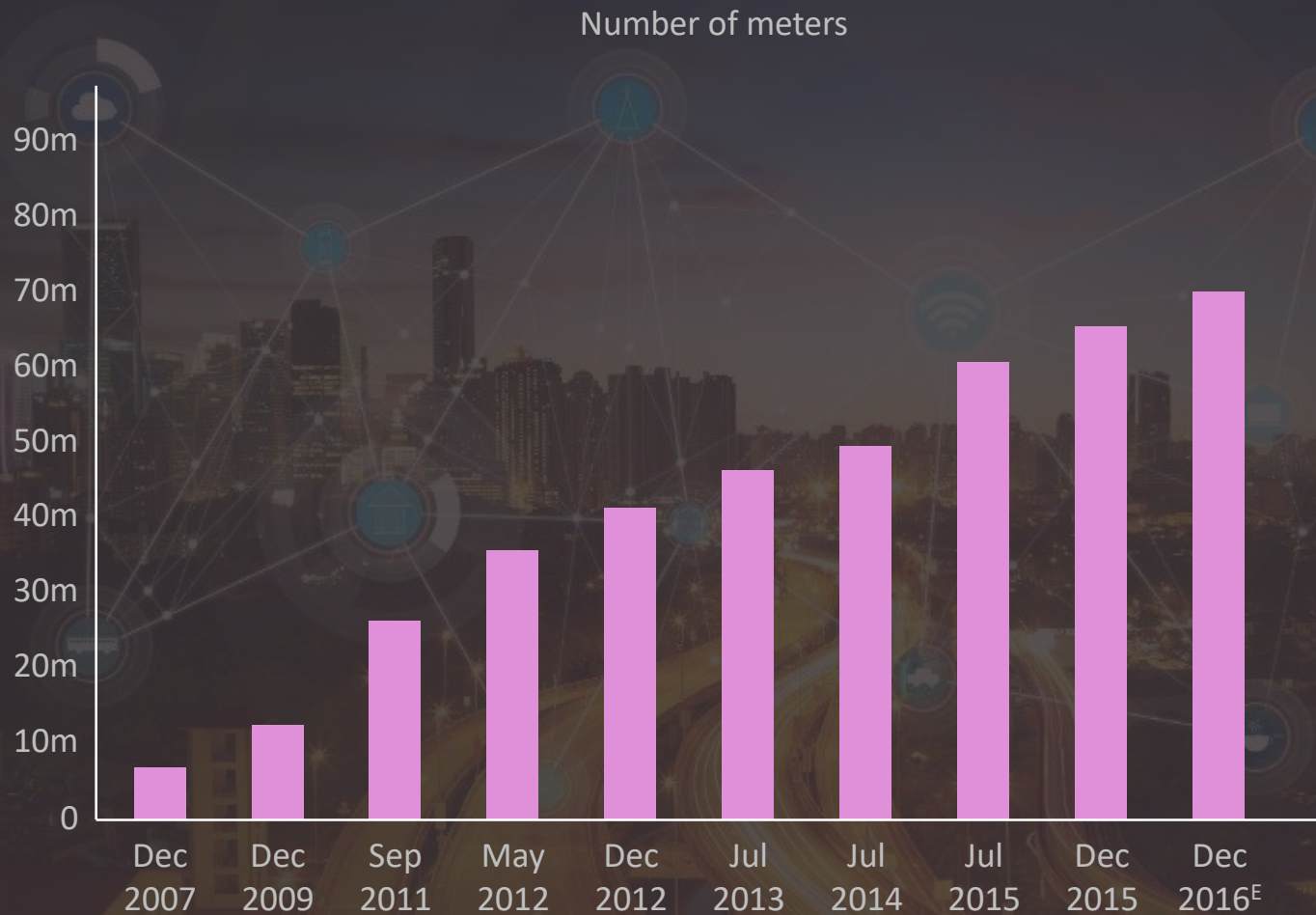
This market growth is visible across all types of sensors, including those measuring particulate matter, CO2 and other emissions

Global revenue for different types of sensors



The physical world is becoming ever more connected to the digital world

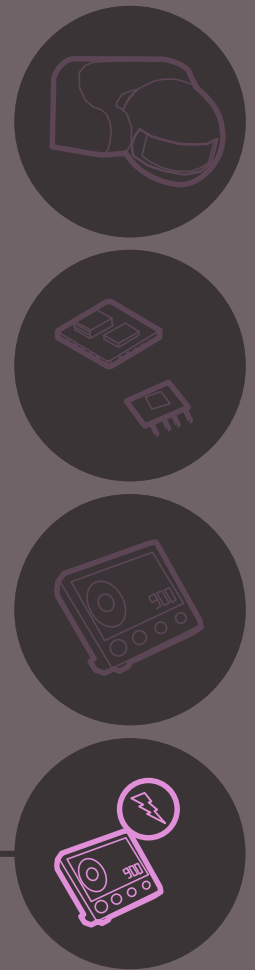
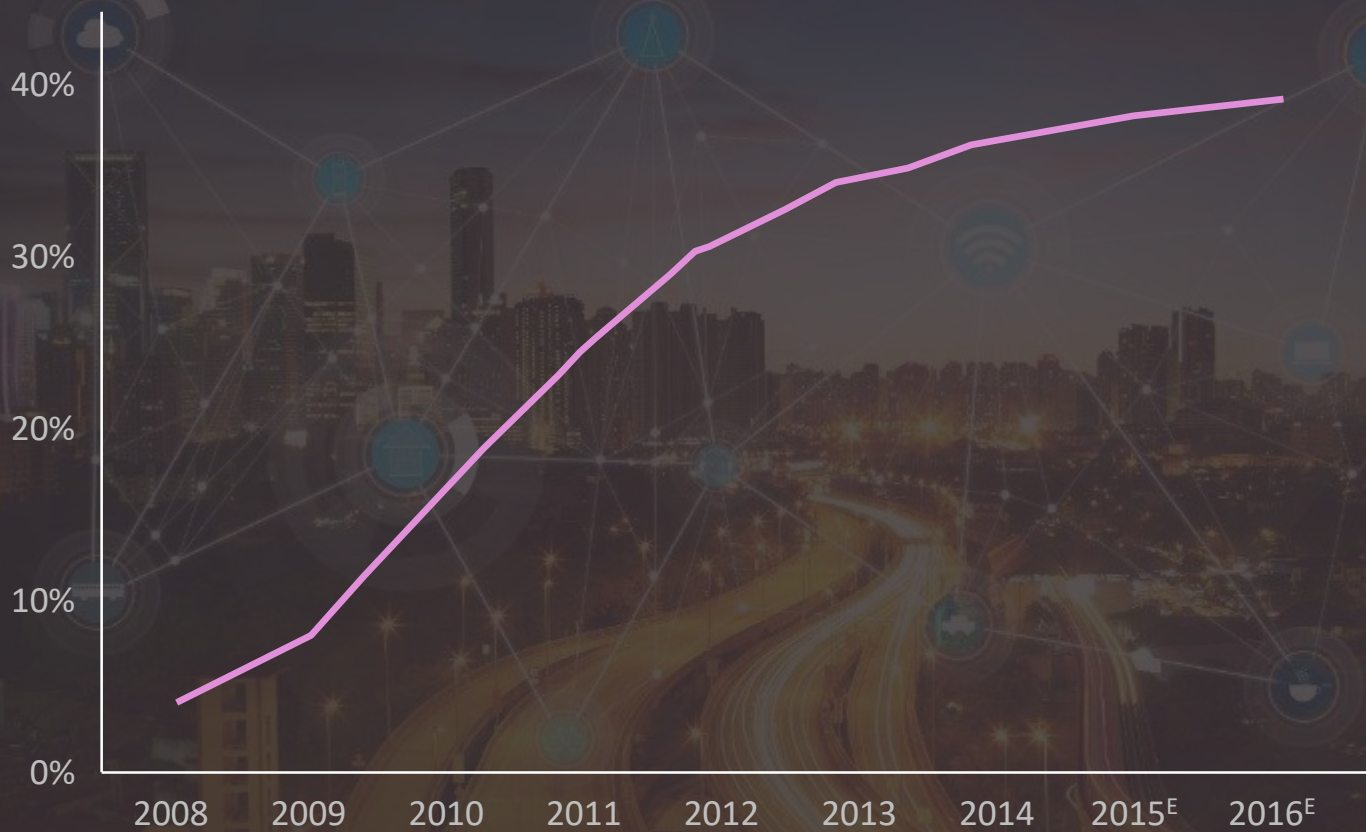
Smart-meter installations were estimated to have hit 70m in the US by the end of 2016



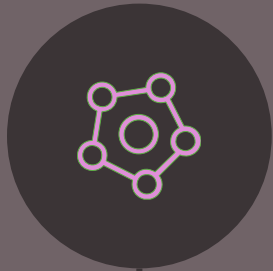
The physical world is becoming ever more connected to the digital world

More US electricity consumers are using smart meters

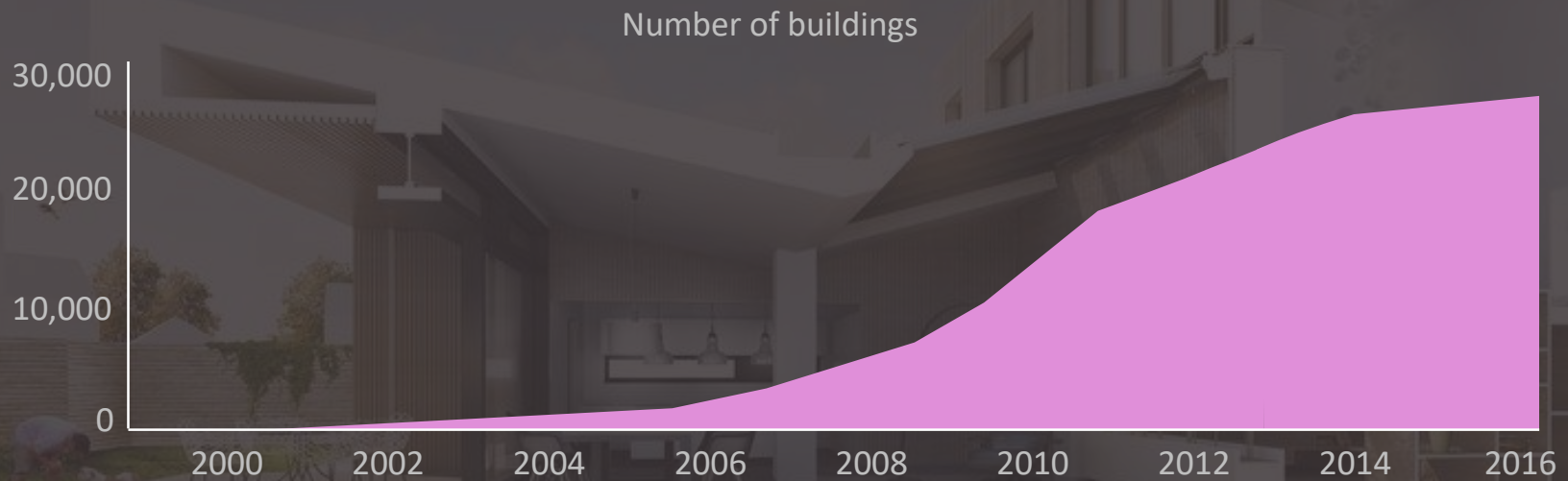
% of US electricity customers



An increasingly populated built environment demands efficient materials



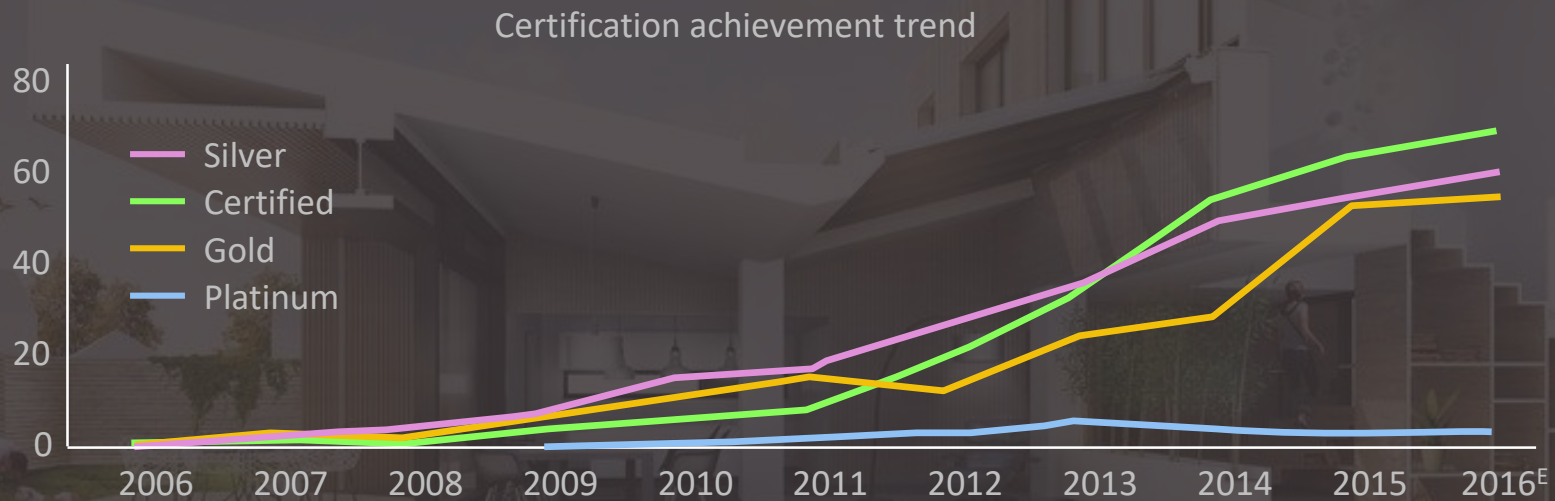
More than 28,000 buildings in the US have earned EPA's Energy Star since 1999



An increasingly populated built environment demands efficient materials



There are more than 1,755 LEED* certified industrial facilities globally, comprising just under 500m square feet

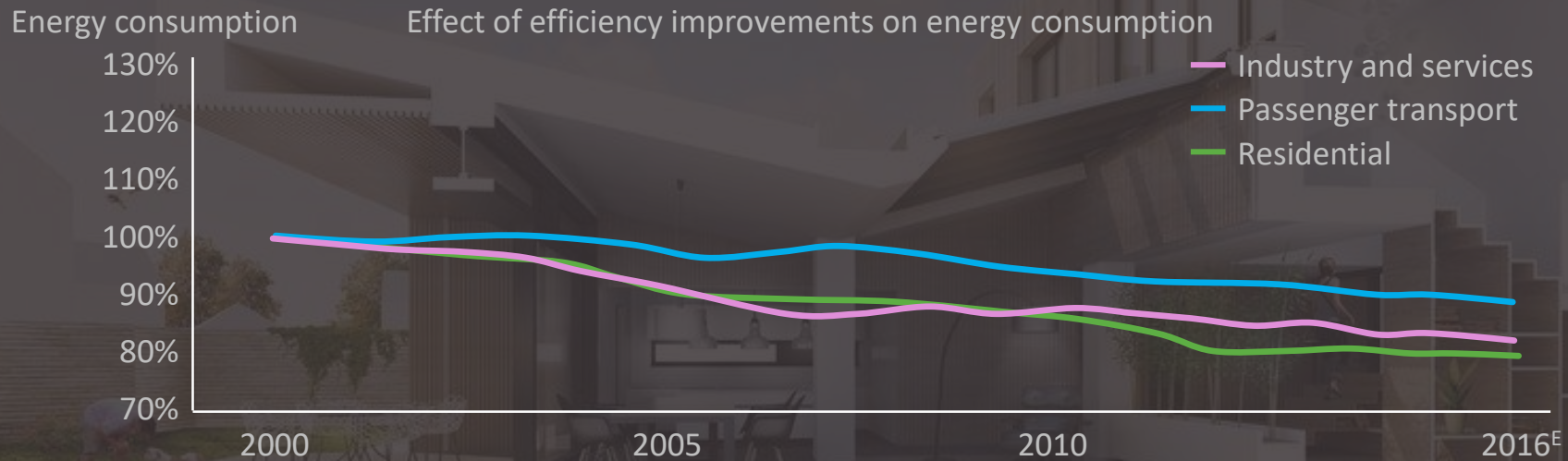


Source: US Green Building Council *Note: LEED – Leadership in Energy and Environmental Design

An increasingly populated built environment demands efficient materials



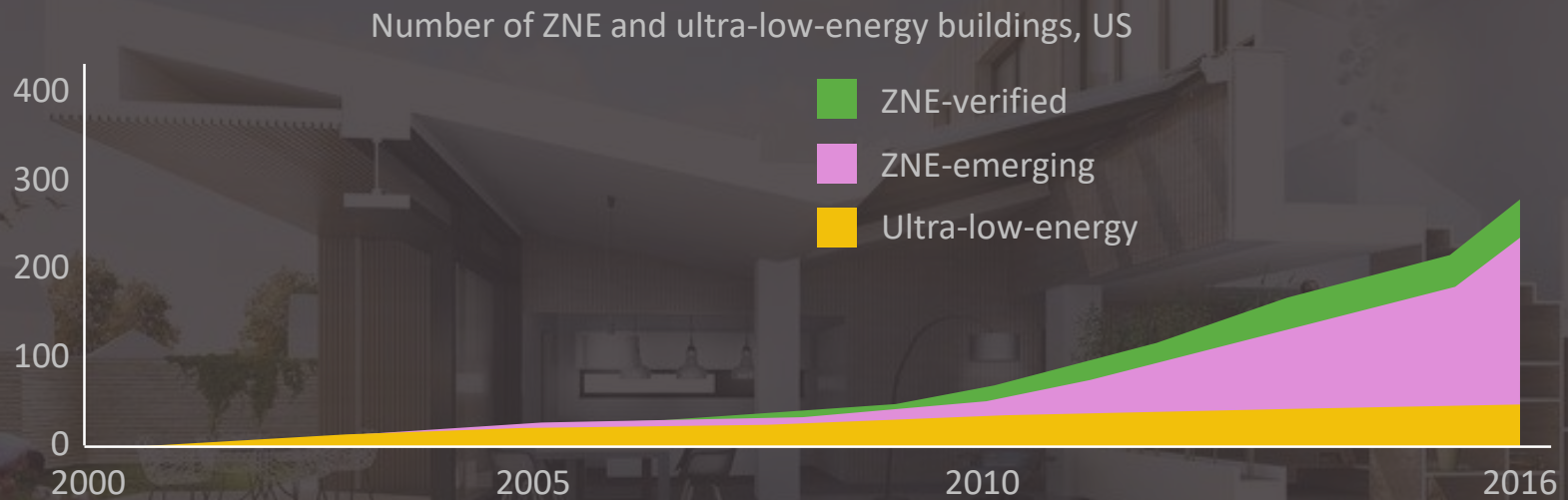
Efficiency enhancements across sectors have significantly reduced energy demands globally



An increasingly populated built environment demands efficient materials



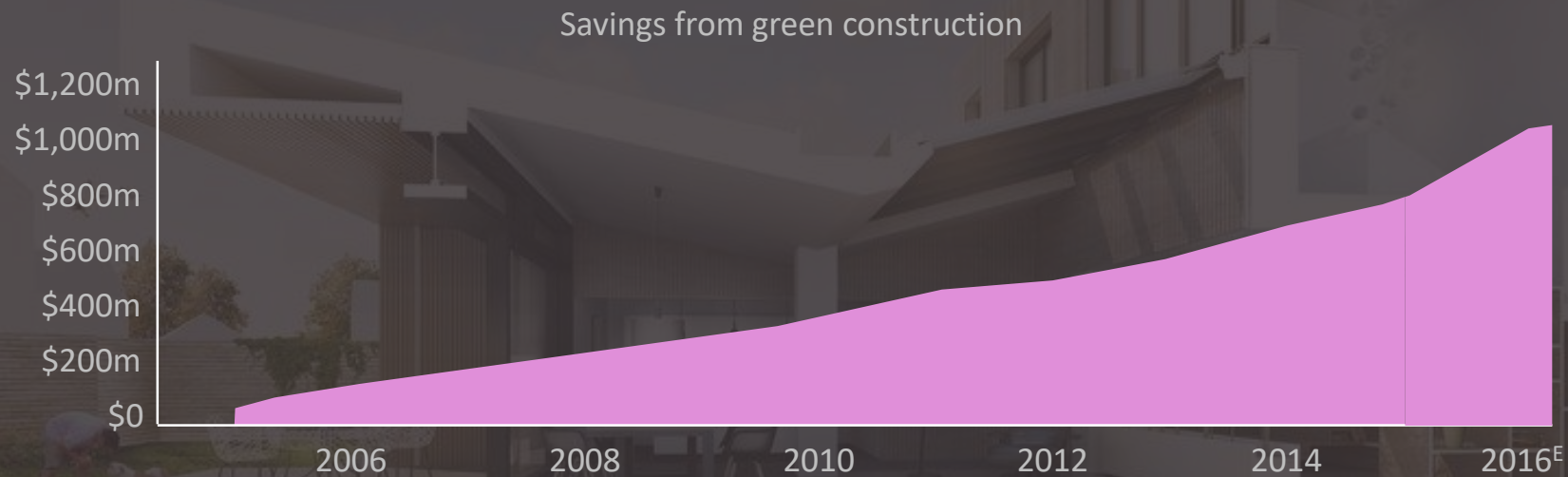
Substantial growth has also been seen in the construction of zero-net-energy (ZNE) buildings



An increasingly populated built environment demands efficient materials



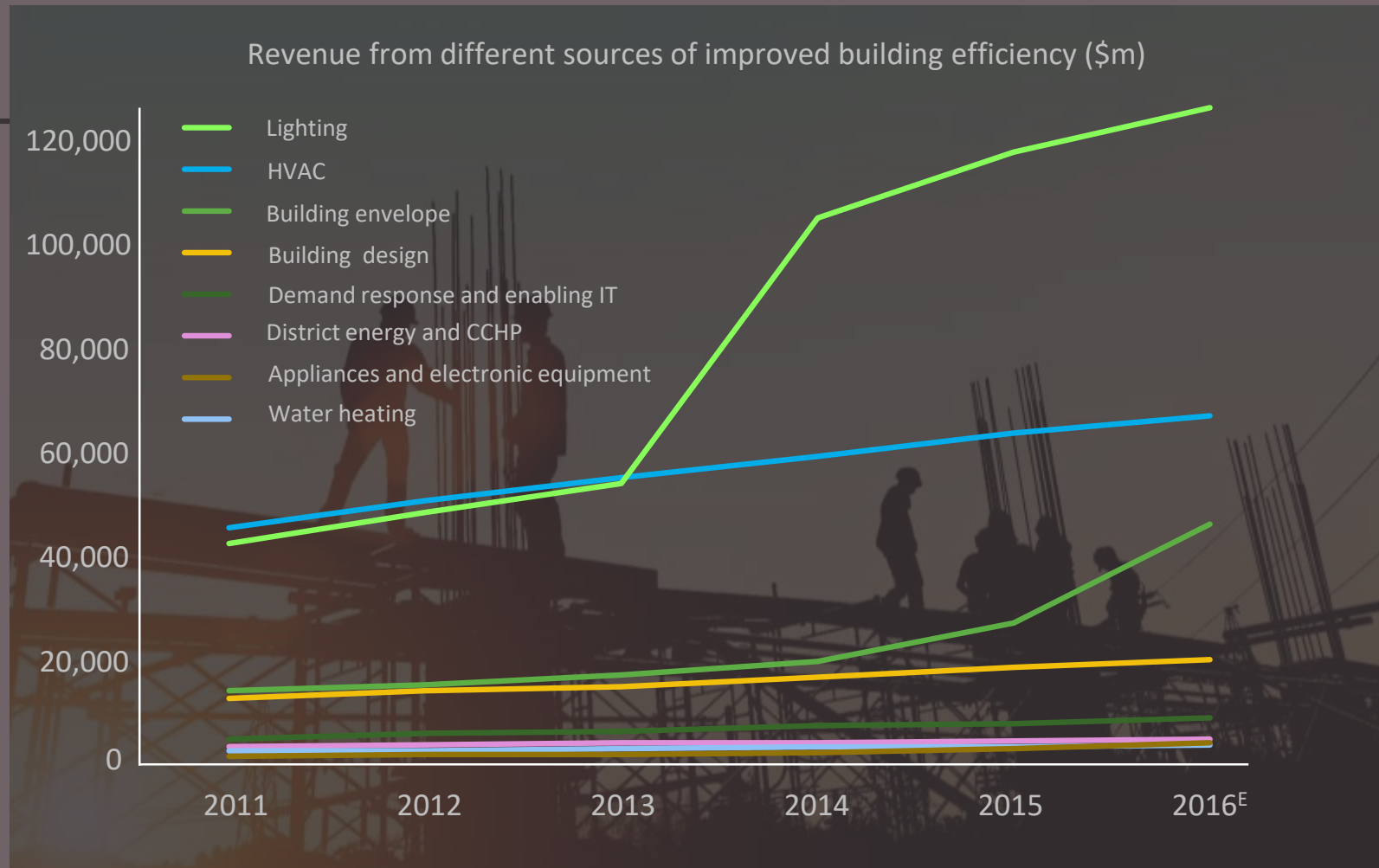
Green buildings result in quantifiable savings such as energy savings and maintenance labour



Source: US Green Building Council *Note: Savings estimates from green buildings are a calculation of reduced operational expenditures (e.g., electricity savings)

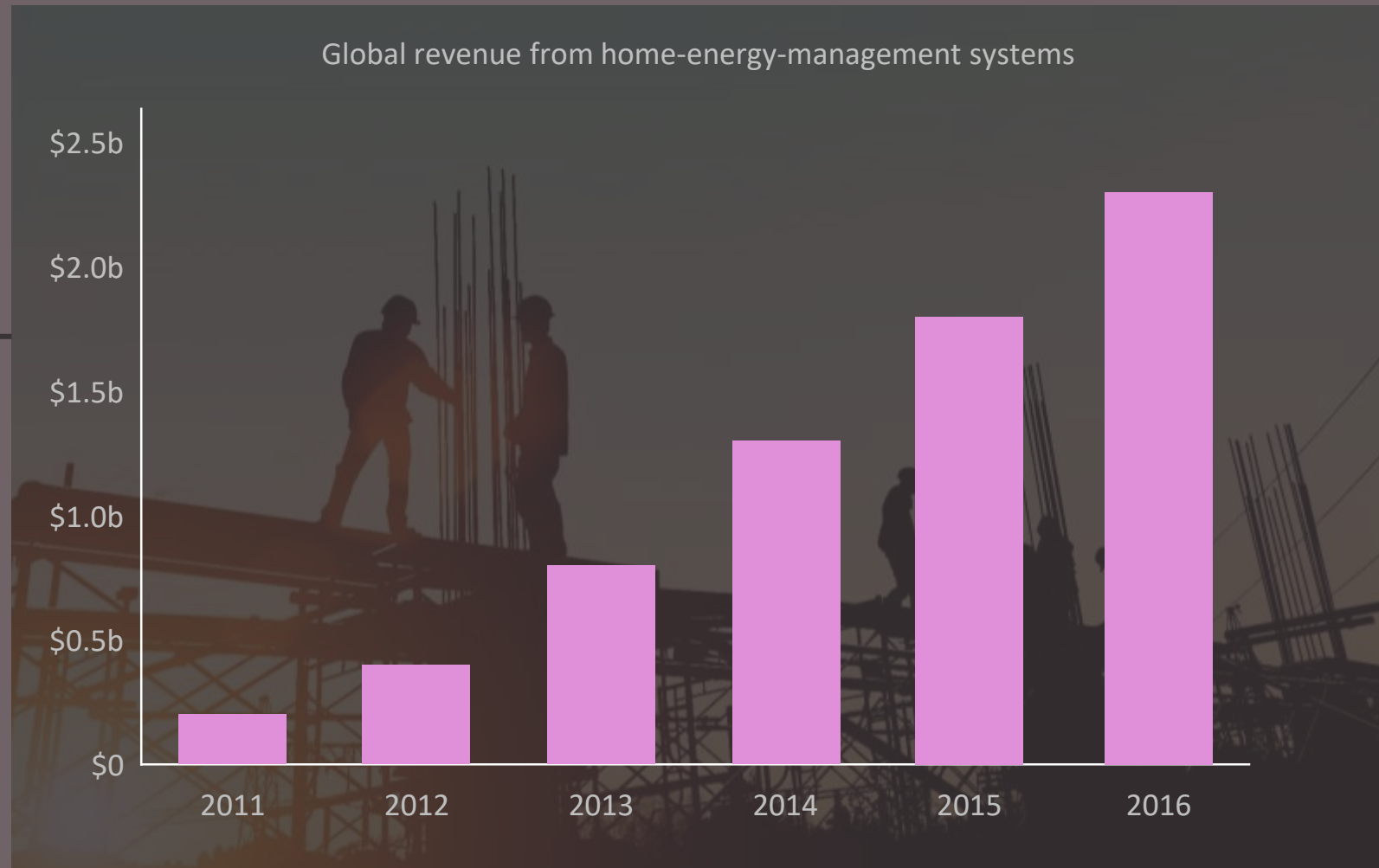
Capital commitments are increasingly being made towards energy efficiency enhancements

The market size for total building efficiency and sub-components continues to grow globally



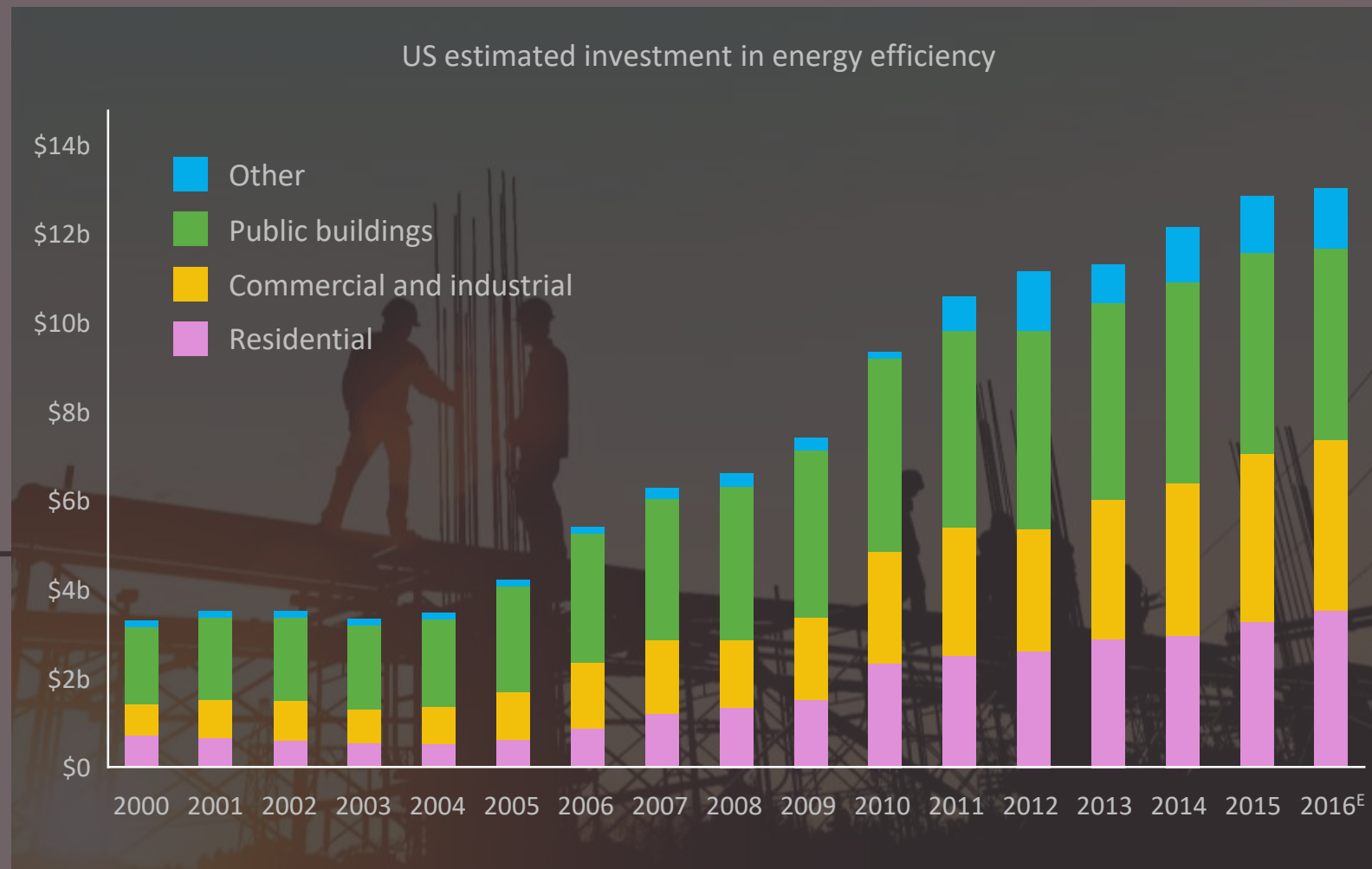
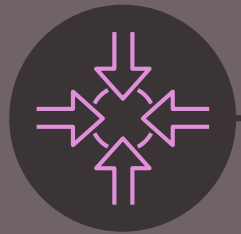
Capital commitments are increasingly being made towards energy efficiency enhancements

Global demand for home energy management systems, which allow households to manage energy usage, has also taken off



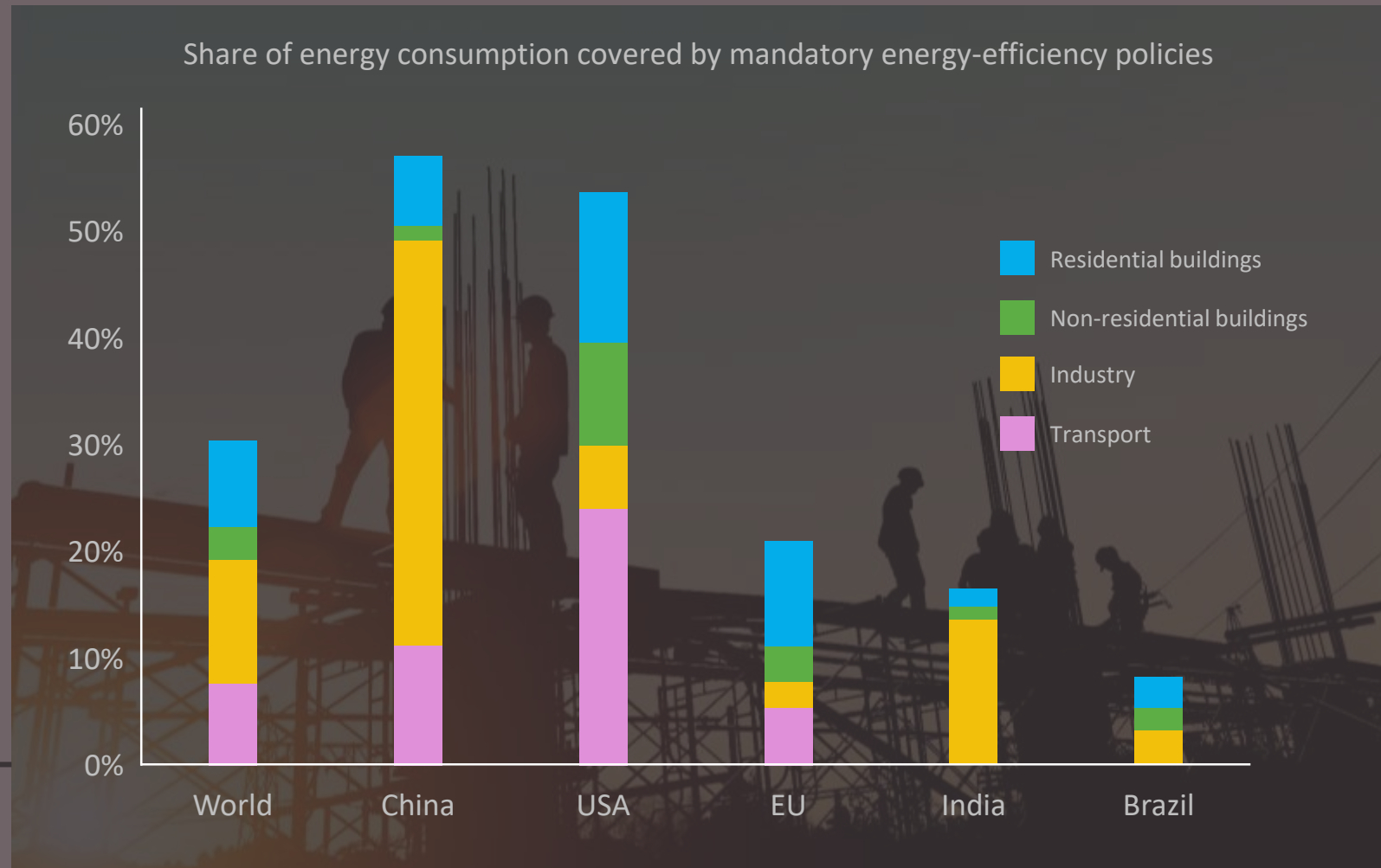
Capital commitments are increasingly being made towards energy efficiency enhancements

Estimates of US investment in energy efficiency have seen significant increase over time

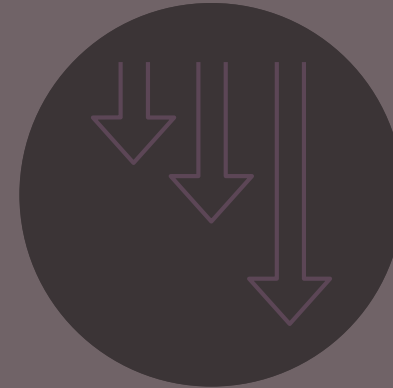


Capital commitments are increasingly being made towards energy efficiency enhancements

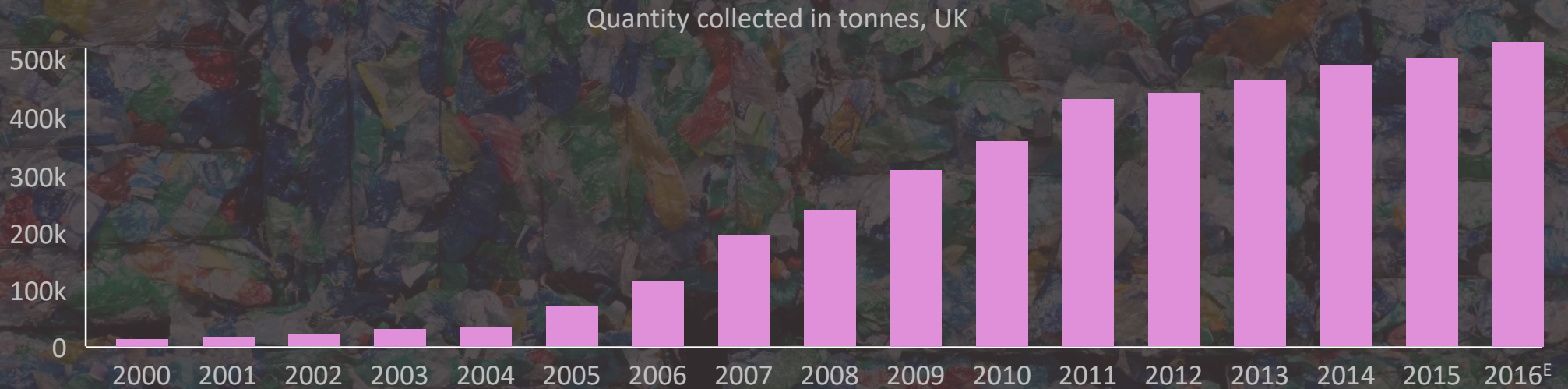
This is likely to continue globally as more and more energy consumption is covered by mandatory energy-efficiency policies



Greater value is being extracted from resources as the global economy becomes more circular



The annual tonnage of post-consumer plastic packaging waste collected for the recycling sector has scaled rapidly



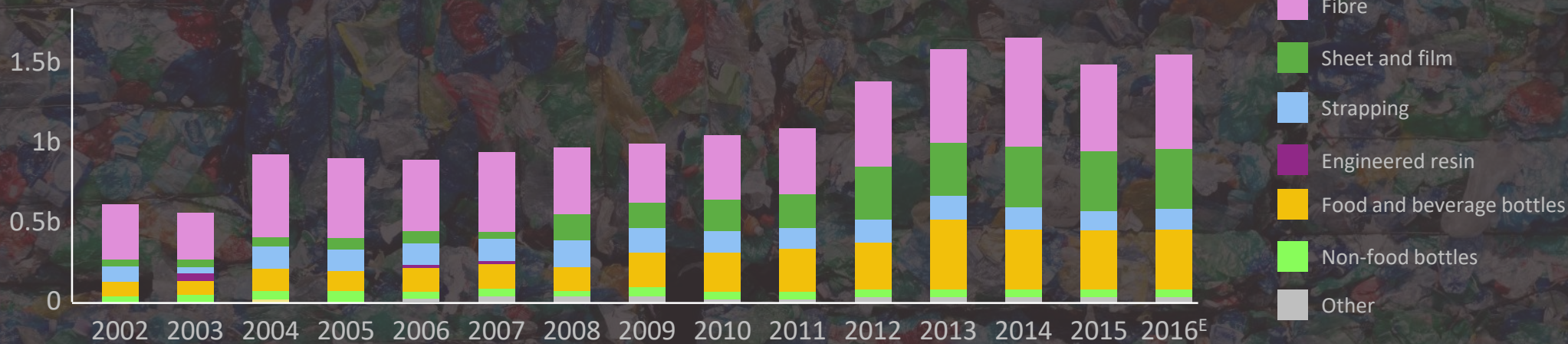
Greater value is being extracted from resources as the global economy becomes more circular



The volume of recycled plastics use in end-markets has seen substantial growth since 2010 across product categories

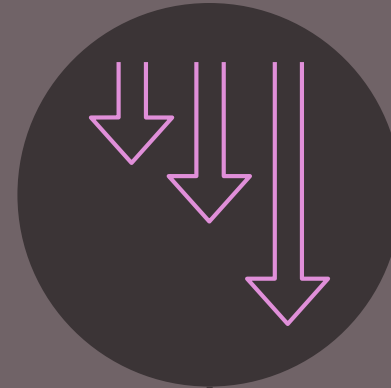
Pounds

RPET used by product category, US



Source: NAPCOR, APR, Waste360

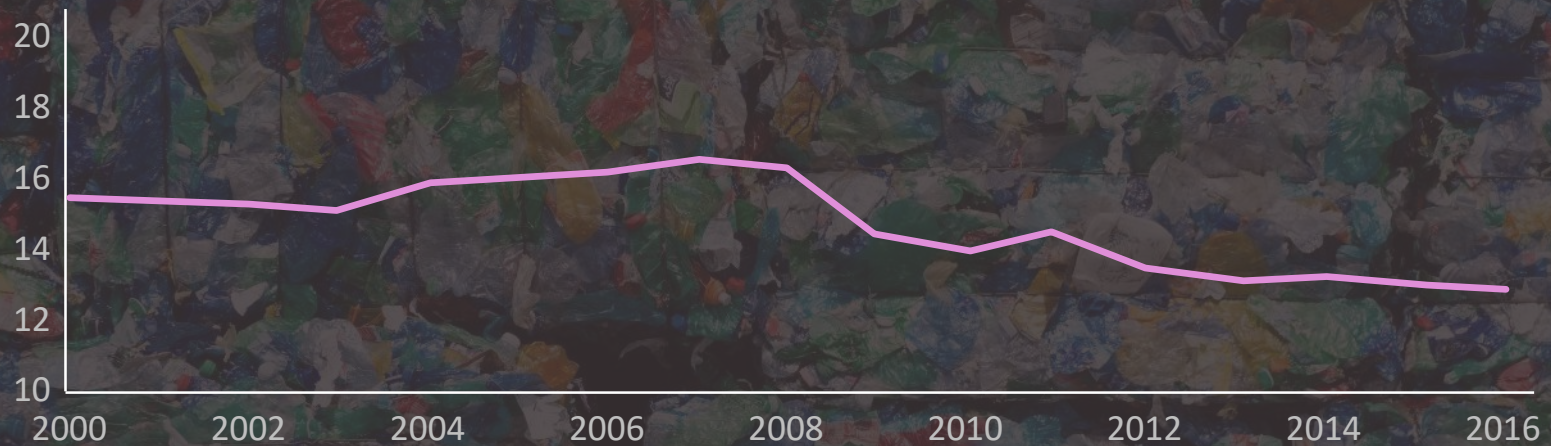
Greater value is being extracted from resources as the global economy becomes more circular



Material consumption appears to be on a downward trend across many developed markets

Tonnes per capita

Material consumption in EU-28

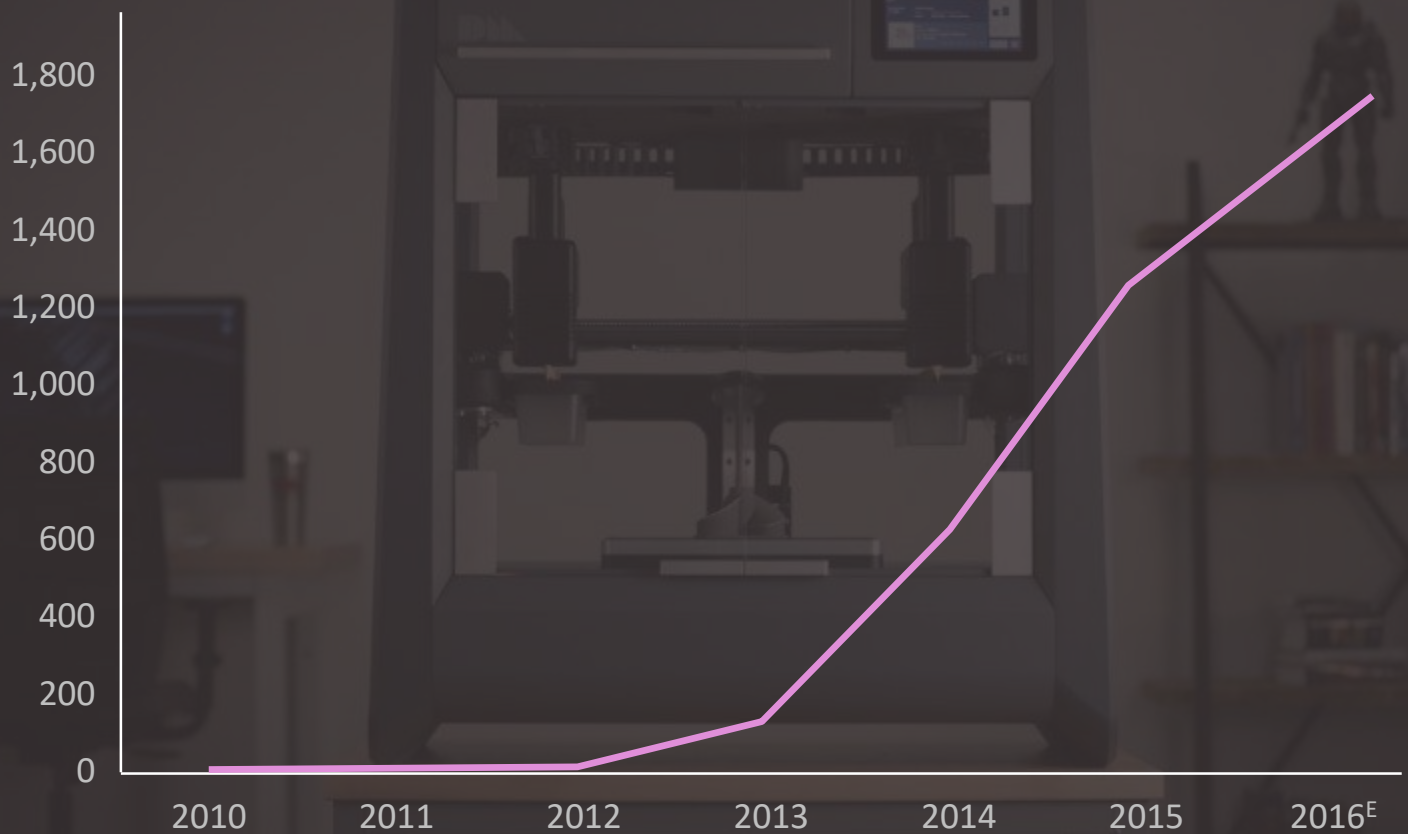


Specific industrial efficiencies are derived from a variety of sources

3D printing will continue to reshape the built environment, playing a key role in the reduction of CO2 emissions

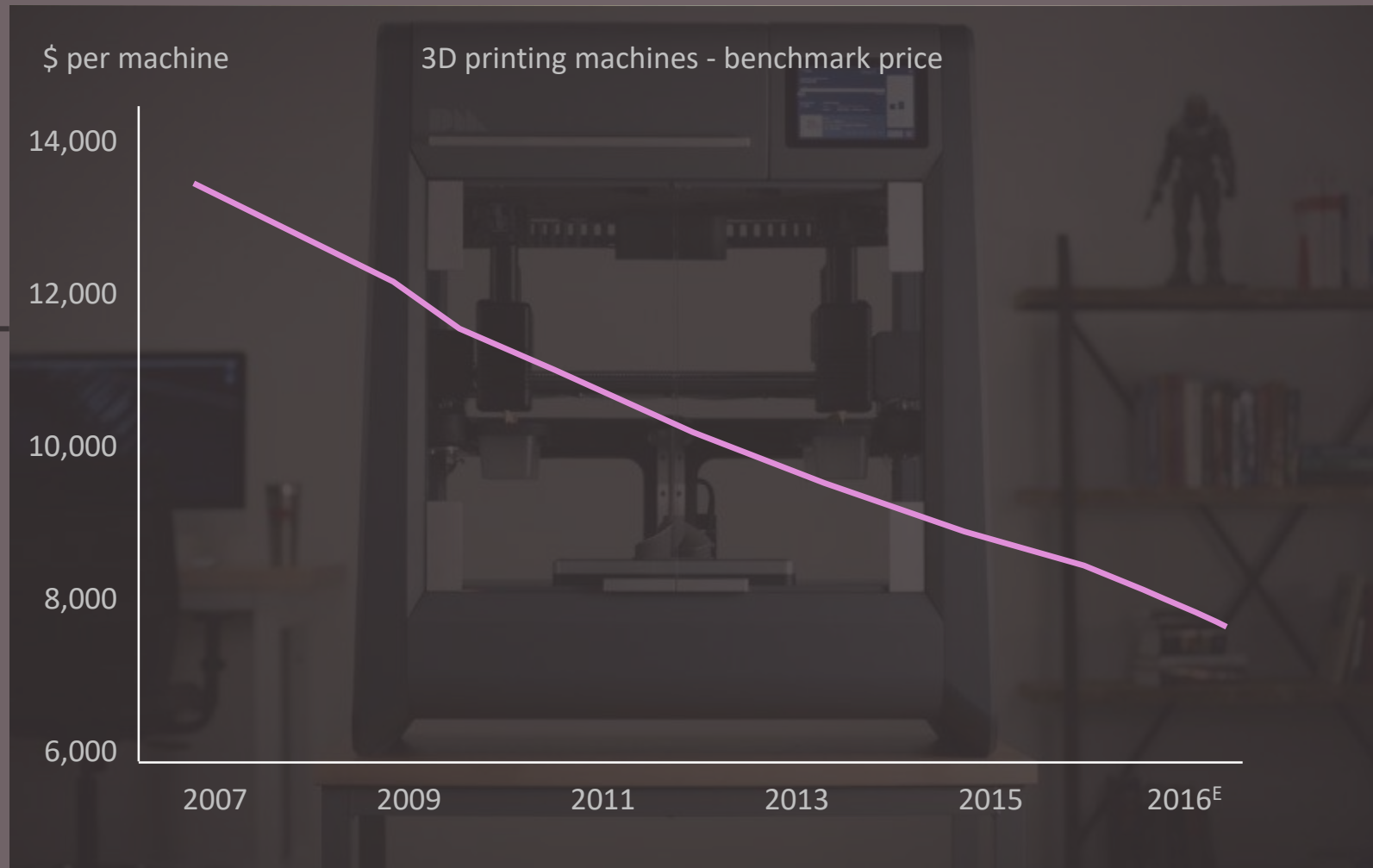


Number of 3D printing patents filed



Specific industrial efficiencies are derived from a variety of sources

Adoption in use and improvement in technology will be made feasible through declining prices



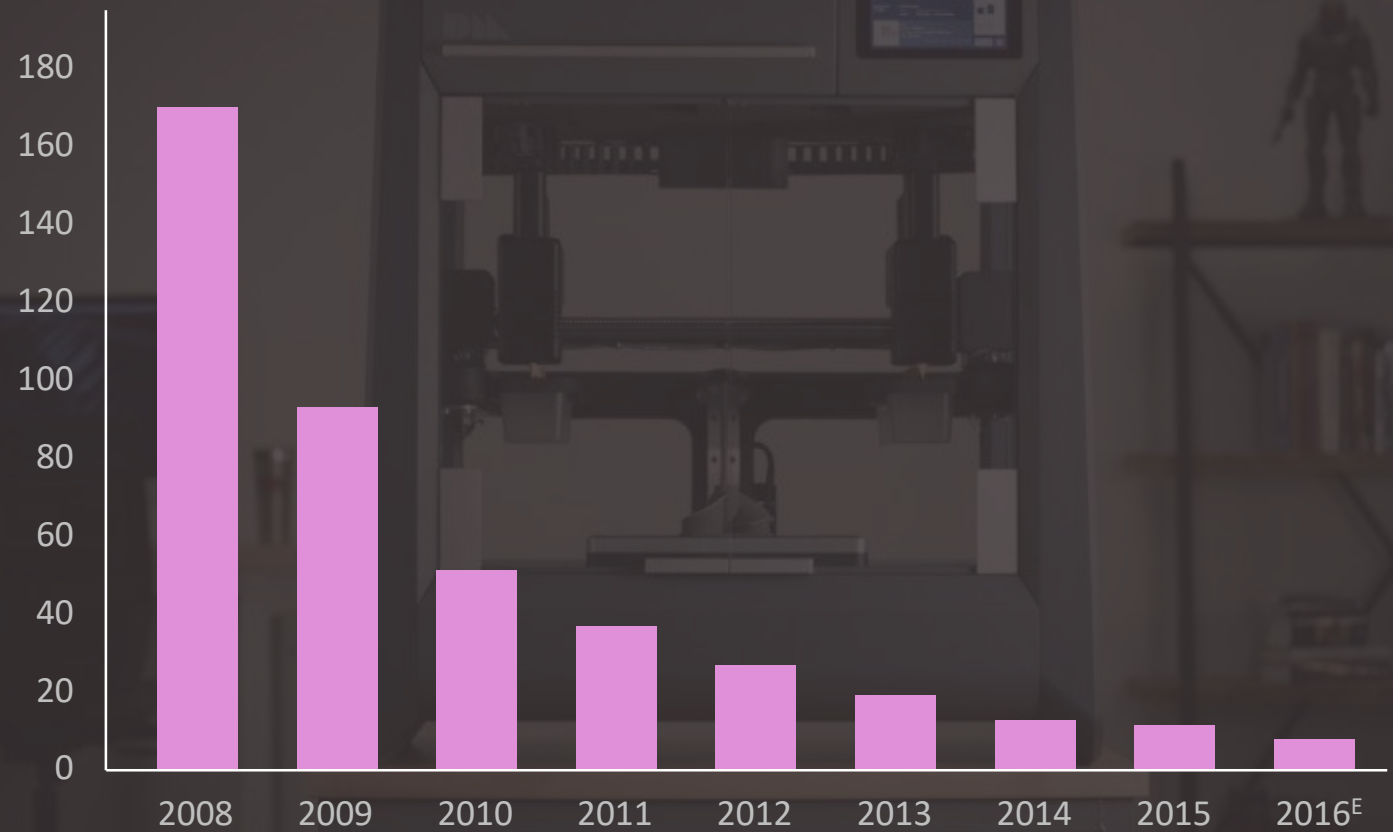
Specific industrial efficiencies are derived from a variety of sources

Similar cost-down curves are appearing across the LED market



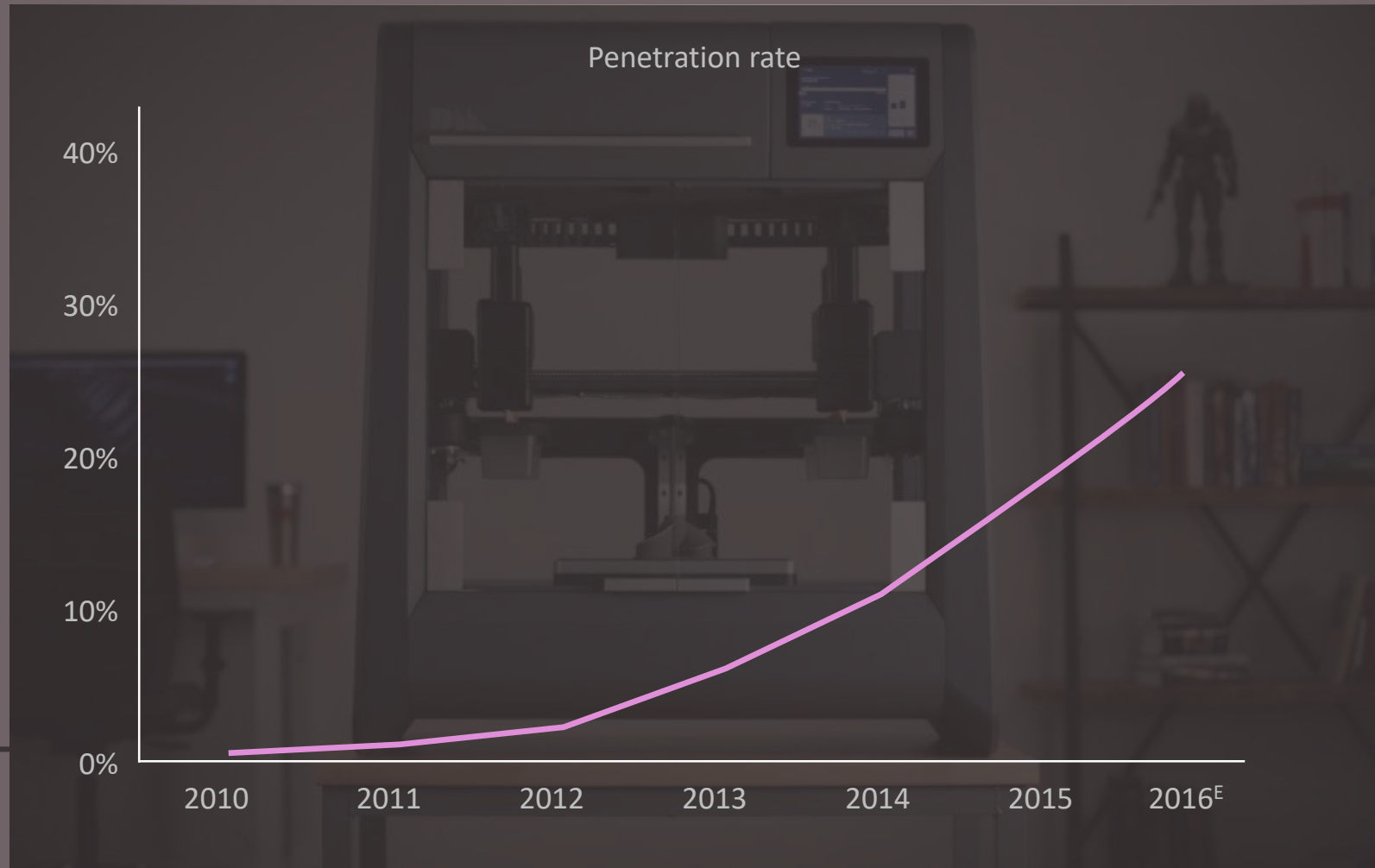
\$ per kilolumen

LED A-Type cost



Specific industrial efficiencies are derived from a variety of sources

Which has manifested in impressive LED penetration of the global lighting market

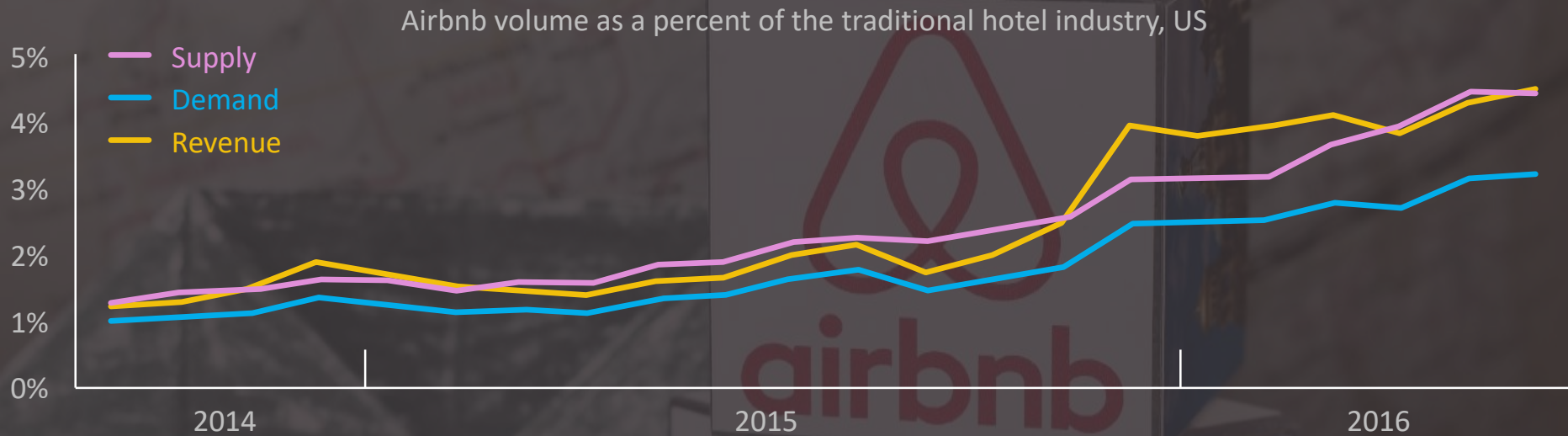


Source: Goldman Sachs; Statista

The improved use of assets is facilitated by a shift towards a sharing economy



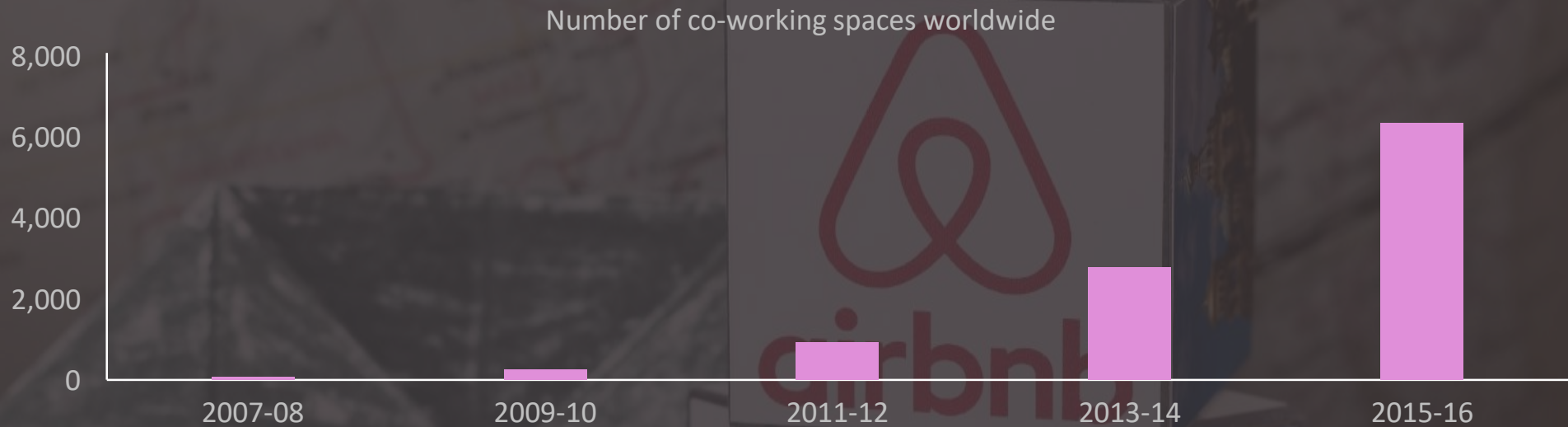
Airbnb continues to scale, offering value to both hosts and guests through the use of otherwise empty spaces



The improved use of assets is facilitated by a shift towards a sharing economy



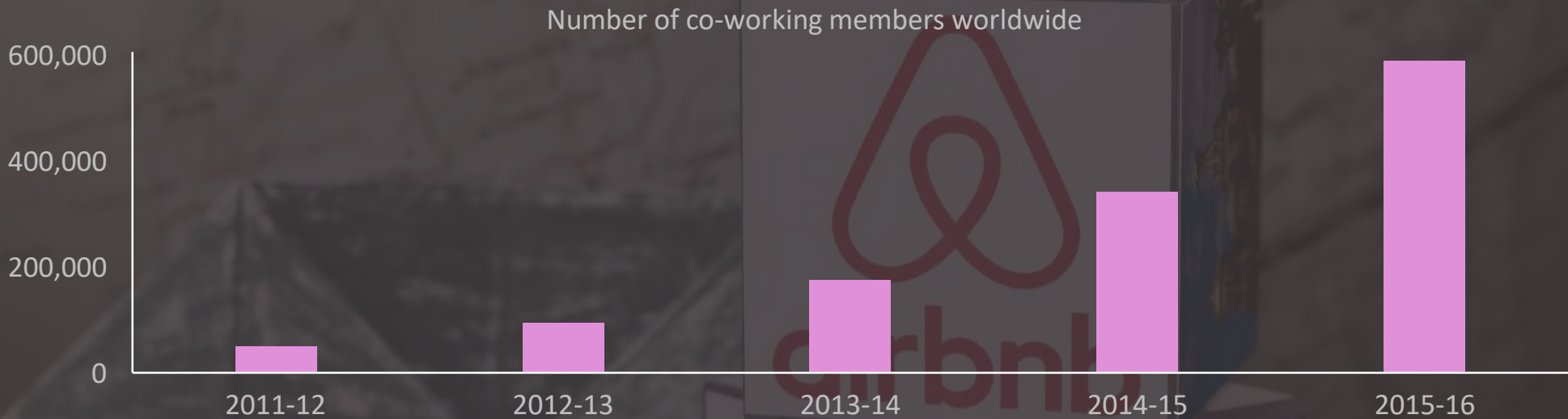
This shift towards the maximisation of asset values is also seen in the growth of co-working spaces globally



The improved use of assets is facilitated by a shift towards a sharing economy



Consumers and companies appear increasingly amenable to this model of space utilisation



The improved use of assets is facilitated by a shift towards a sharing economy

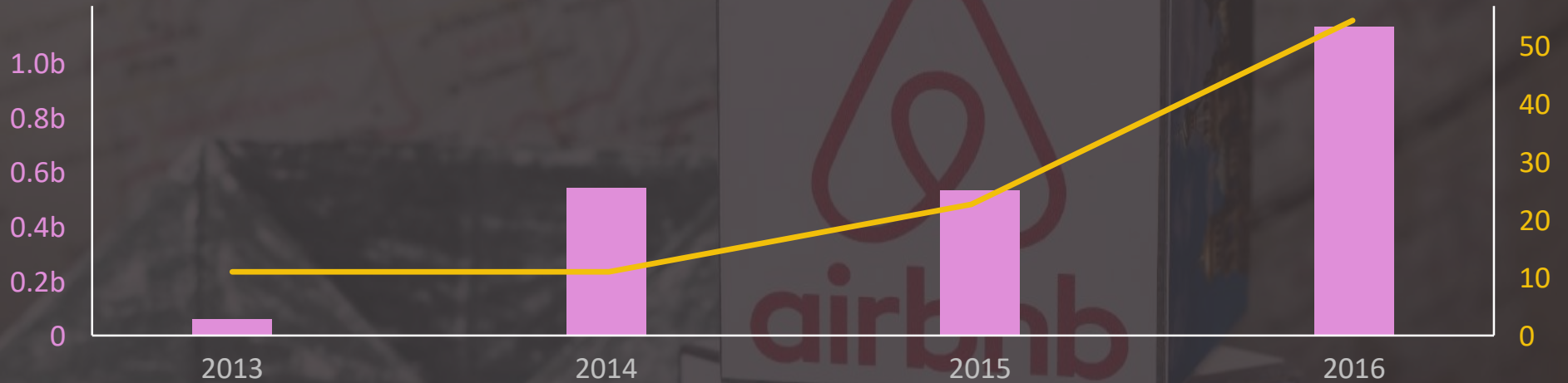


Capital continues to flow to these models which promote efficiency and reduce the need for resource-intensive infrastructure

Funding amount (\$)

Financings in co-working space start-ups

Number of deals



Built environment trends to monitor:



The move to a zero-waste economy and a reduction in pollution (including noise pollution) across markets



Global increase in the use of efficient and renewable materials in buildings



Resilient cybersecurity solutions addressing needs of an increasingly connected society



Universal access to sustainable housing and infrastructure



...among others



FOOD SYSTEMS

We believe sustainable food systems are centred around:



The displacement of animal protein by superior alternatives



Improved information access around best-practice sourcing and farming



Conscientious consumer choices aligned with sustainability



A clear focus on nutritional value and health



Last mile and infrastructure efficiencies facilitated by a move online



Focus by the restaurant industry on food-waste reduction



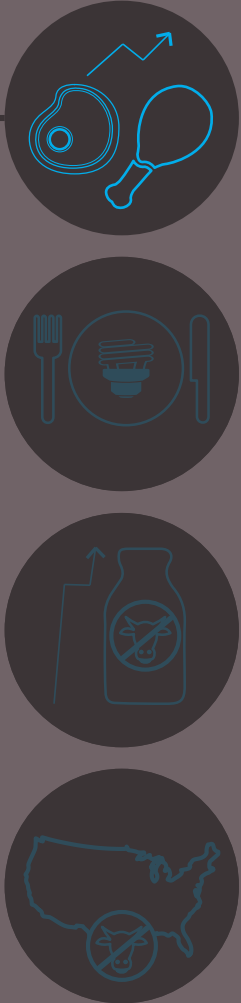
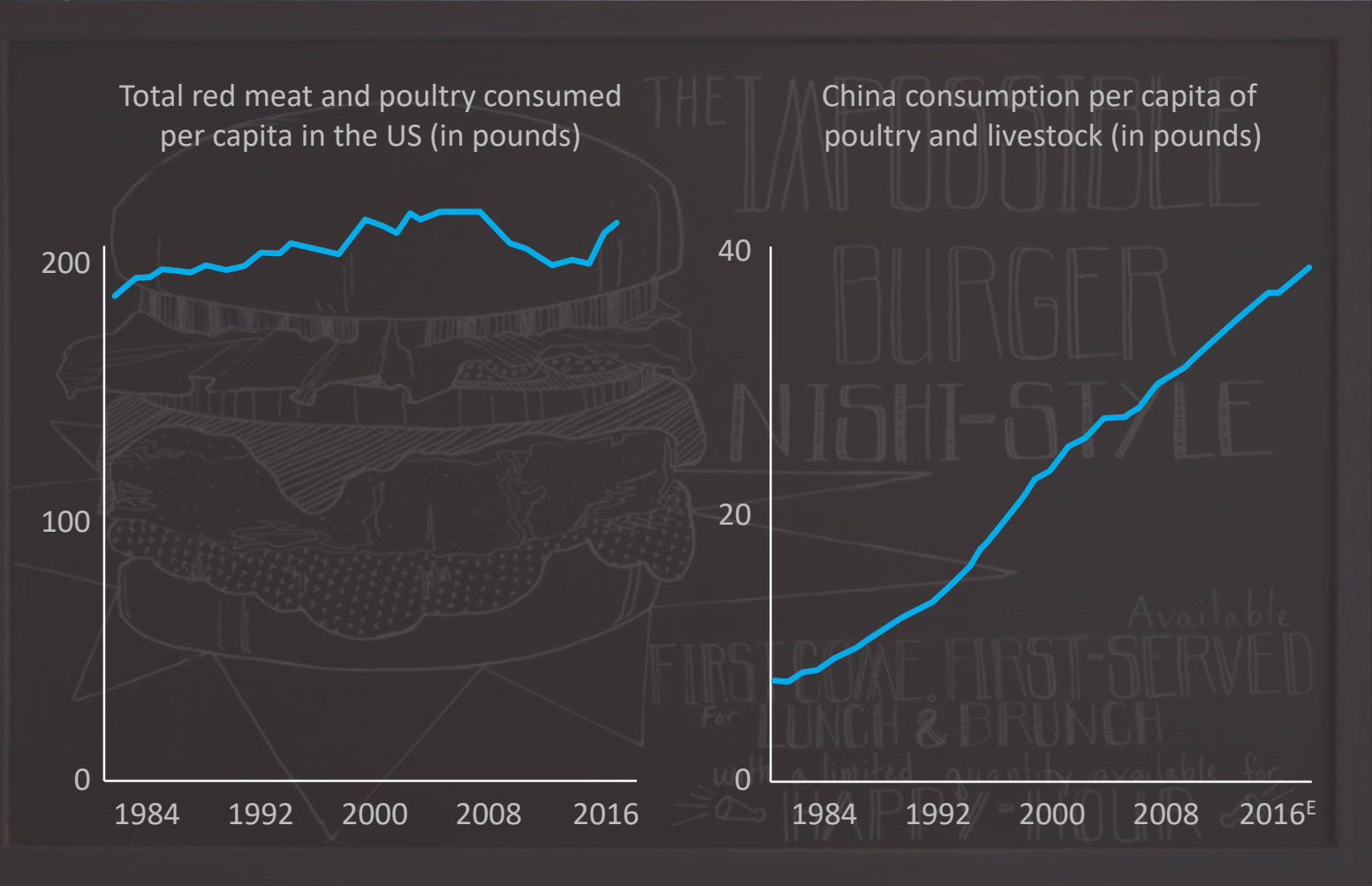
Optimisations in sourcing and agriculture



Enhanced earth observation tools and analytics for environmental monitoring

Plant-based protein sources are emerging as a viable alternative in protein-heavy diets

While consumption of animal-based protein continues to rise globally...

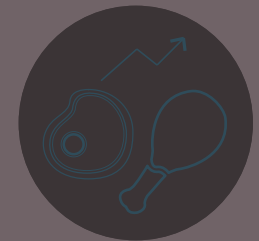
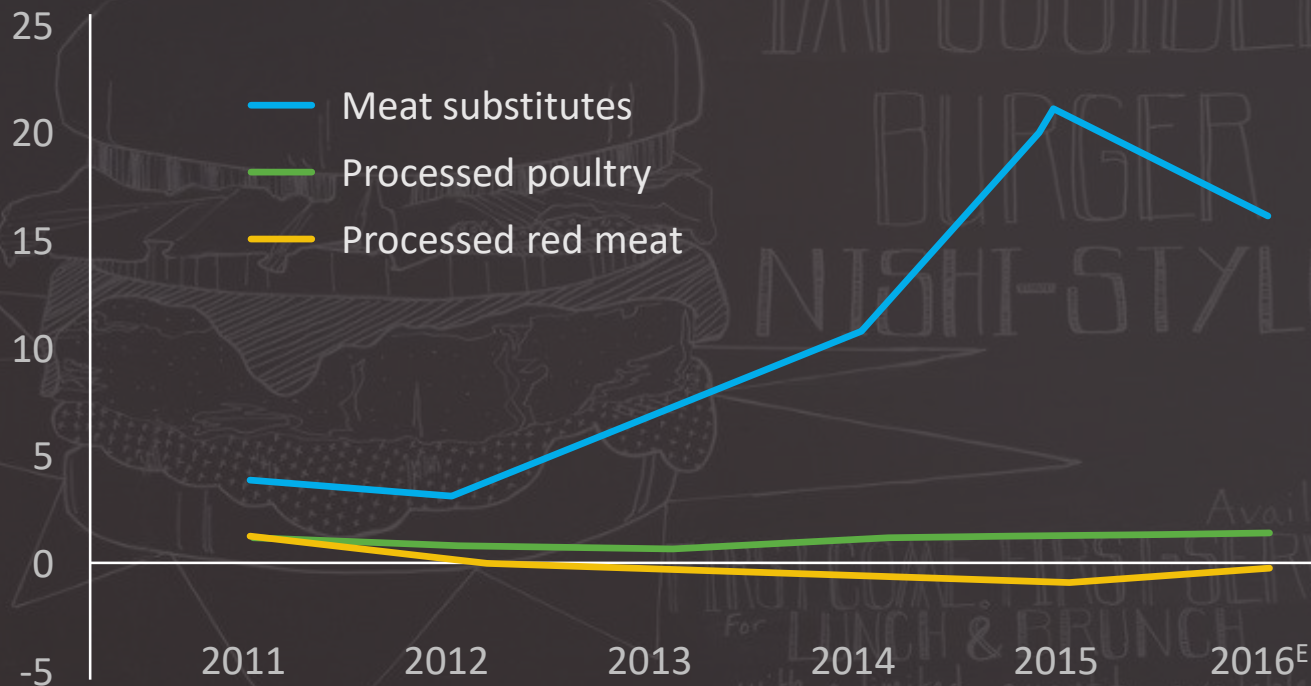


Source: USDA, US National Chicken Council, FAOSTAT

Plant-based protein sources are emerging as a viable alternative in protein-heavy diets

Alternative proteins and meat substitutes are gaining market share in many markets

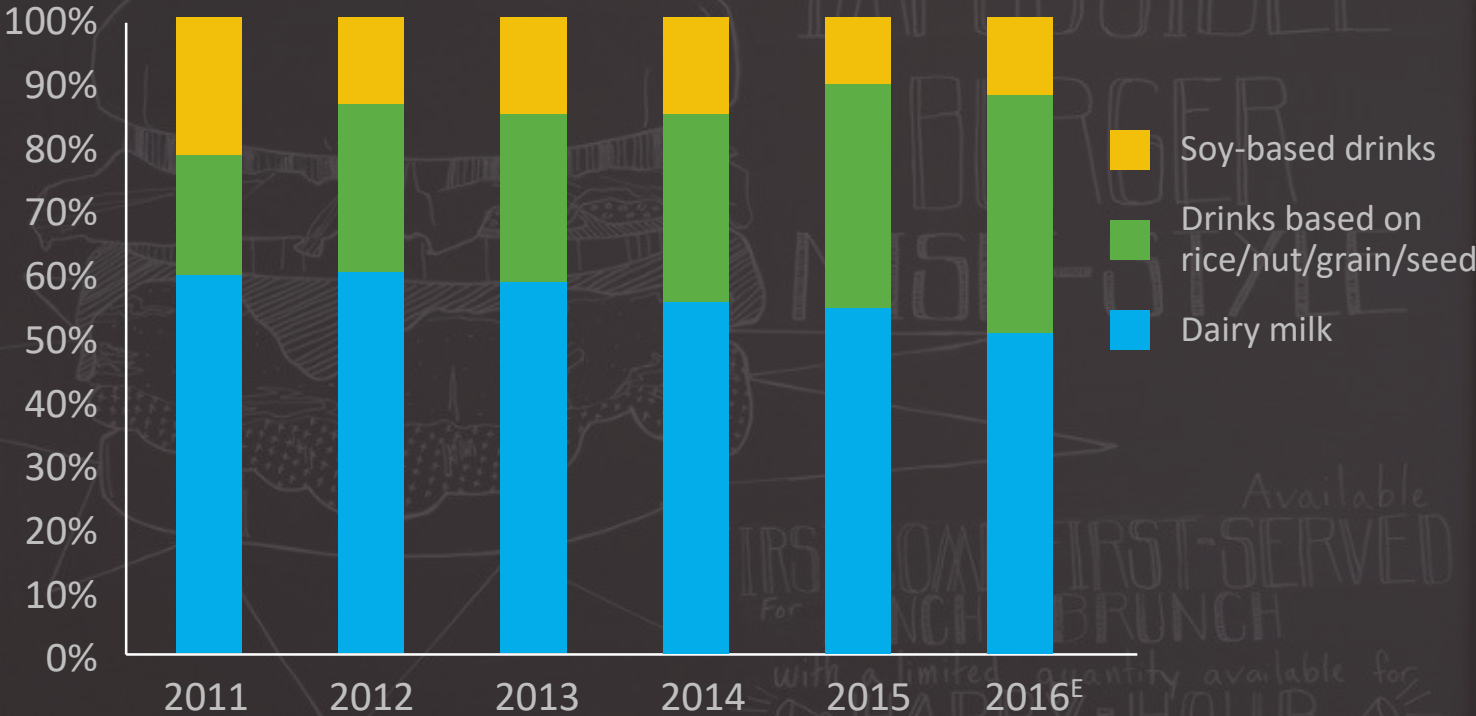
Western Europe: Retail volume growth 2011-2016 (% y-o-y)



Plant-based protein sources are emerging as a viable alternative in protein-heavy diets

Non-dairy milk product innovations are also on the rise

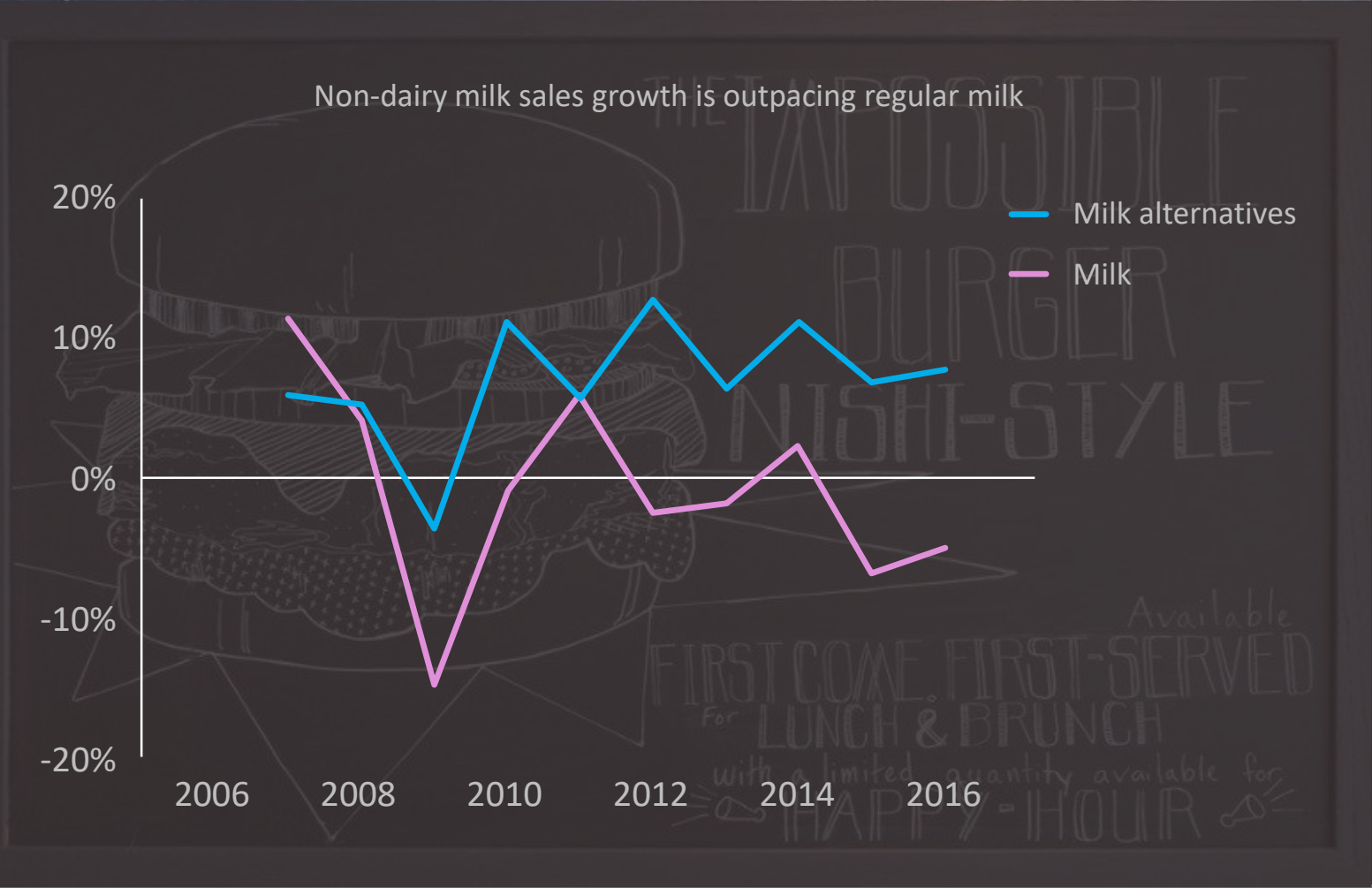
Milk launches by type, North America/Europe/Australasia (%)



Source: Mintel

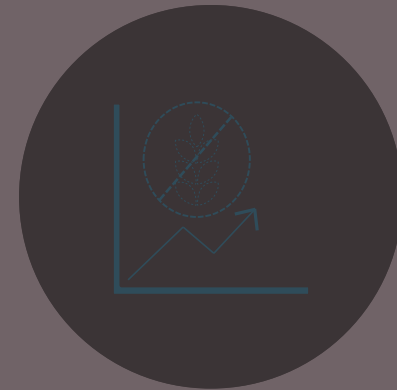
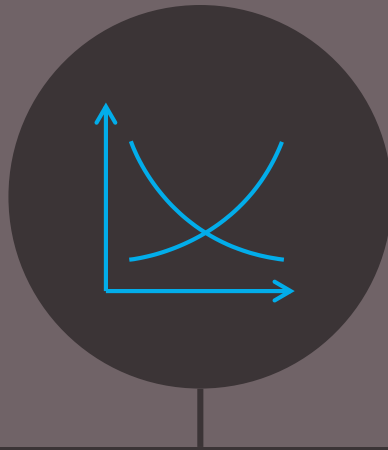
Plant-based protein sources are emerging as a viable alternative in protein-heavy diets

The US non-dairy milk market is estimated to represent well over 10% of the total milk market, and sales continue to outpace regular milk



Source: Atlas, Euromonitor, Quarts, Mintel

Certification schemes inform consumers and galvanise sustainability-oriented consumer purchases



The number of USDA certified organic operations is nearly triple what it was in 2002



Source: USDA Note: Foreign operations may also be certified to the USDA organic standards

Certification schemes inform consumers and galvanise sustainability-oriented consumer purchases

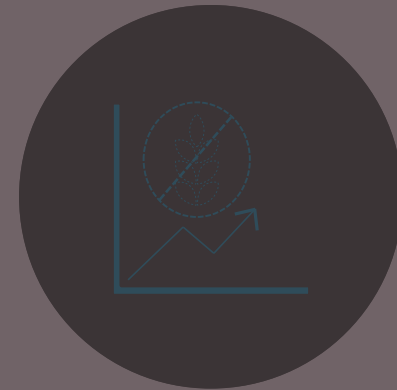


Suppliers are meeting consumer demand for more sustainable fishing practices

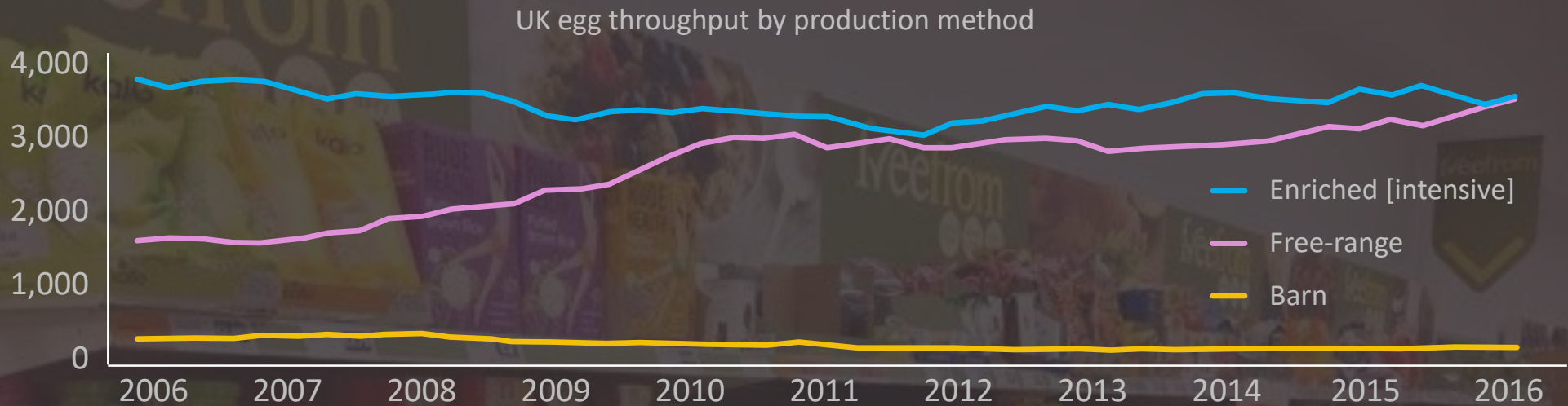
Number of products globally with the MSC label



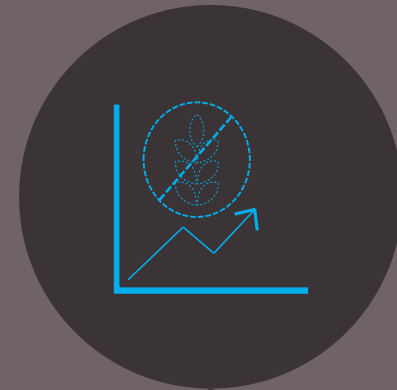
Certification schemes inform consumers and galvanise sustainability-oriented consumer purchases



Free-range eggs are also gaining rapid market share



Certification schemes inform consumers and galvanise sustainability-oriented consumer purchases



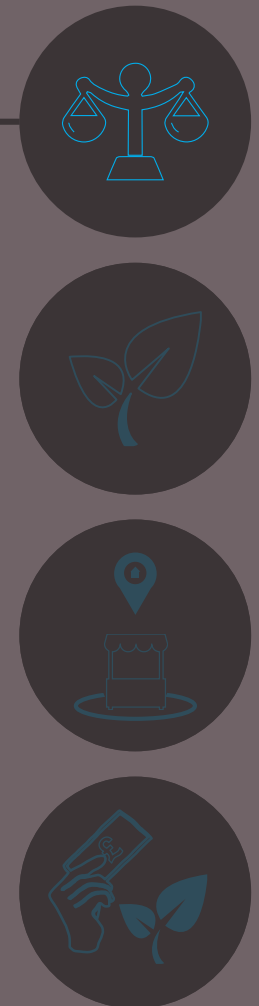
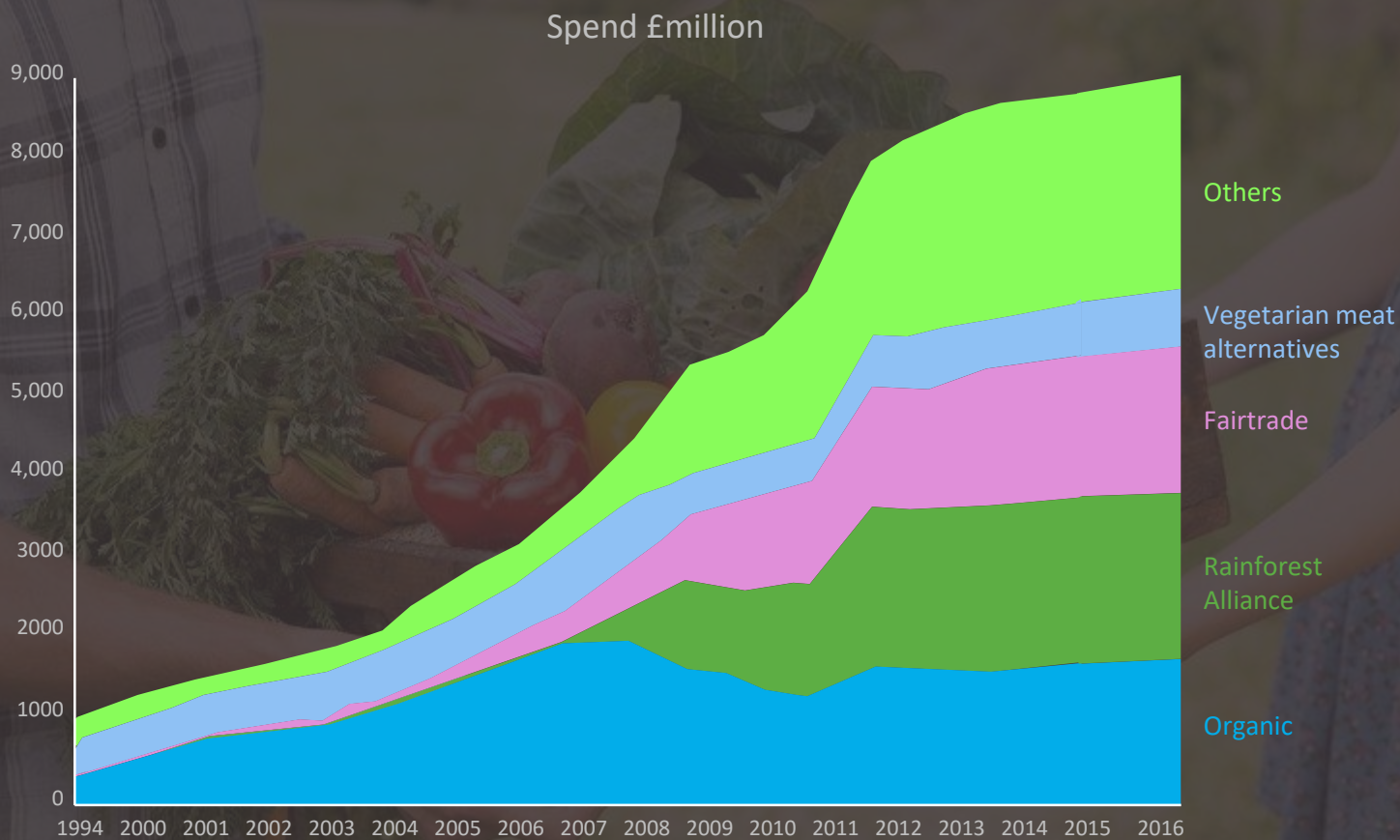
“Free-from” products are also rapidly gaining shelf space worldwide



Source: Mintel *Gluten-free covers only bakery, cereals, snacks, pasta & noodles

Trends in consumer purchasing are driven by environmental and social considerations

Sales of “ethical” food and drink have risen over time in the UK as a proportion of all sales of household food



Source: Triodos Bank and Ethical Consumer; SustainWeb

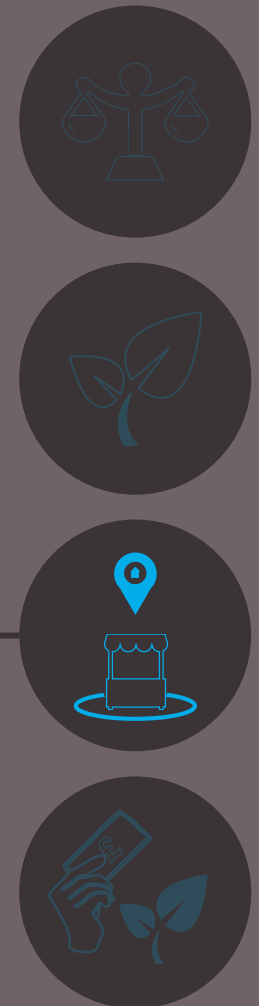
Trends in consumer purchasing are driven by environmental and social considerations

Veganism is becoming more popular as a concept and dietary practice



Trends in consumer purchasing are driven by environmental and social considerations

There is an increasing emphasis on “buying local” as exemplified by a rising trend in farmers’ markets

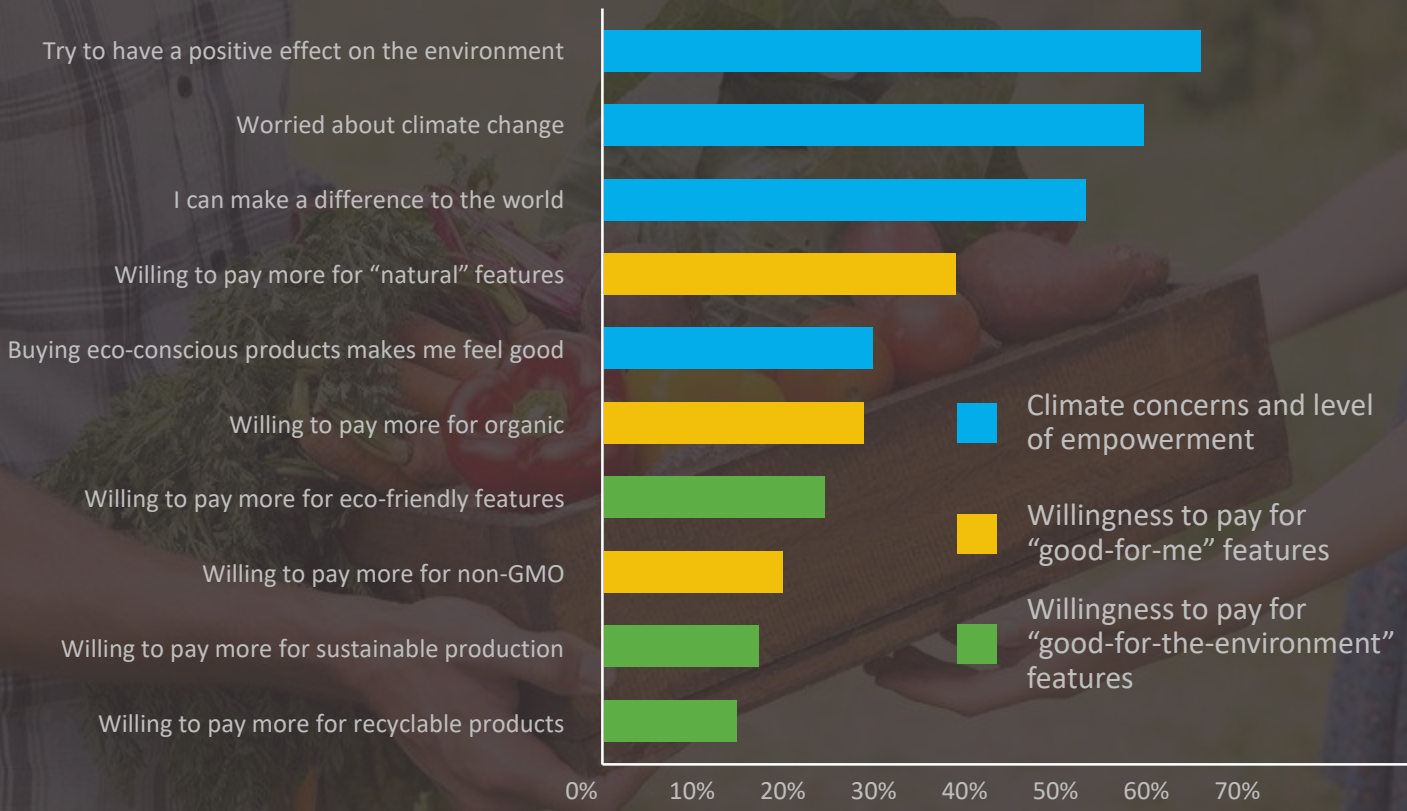


Source: USDA, Economic Research Service using USDA, Agricultural Marketing Service, Farmers’ Market Surveys

Trends in consumer purchasing are driven by environmental and social considerations

Consumers continue to say that they are willing to pay for sustainable features

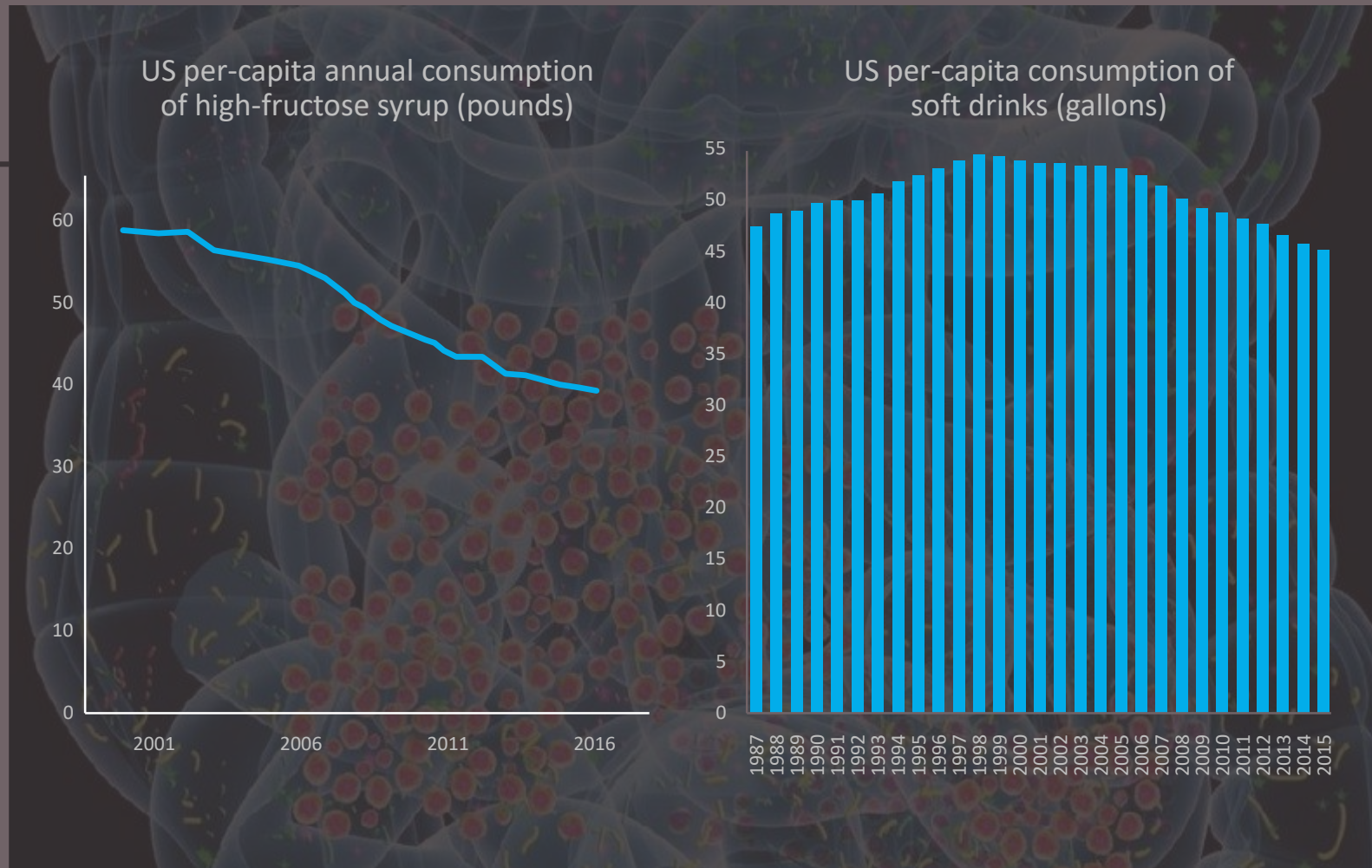
Environmental concerns and willingness to pay for green features



Source: Euromonitor International Global Consumer Trends Survey 2016

Consumers are forging their own nutritional diets, with increased focus on microorganisms and health

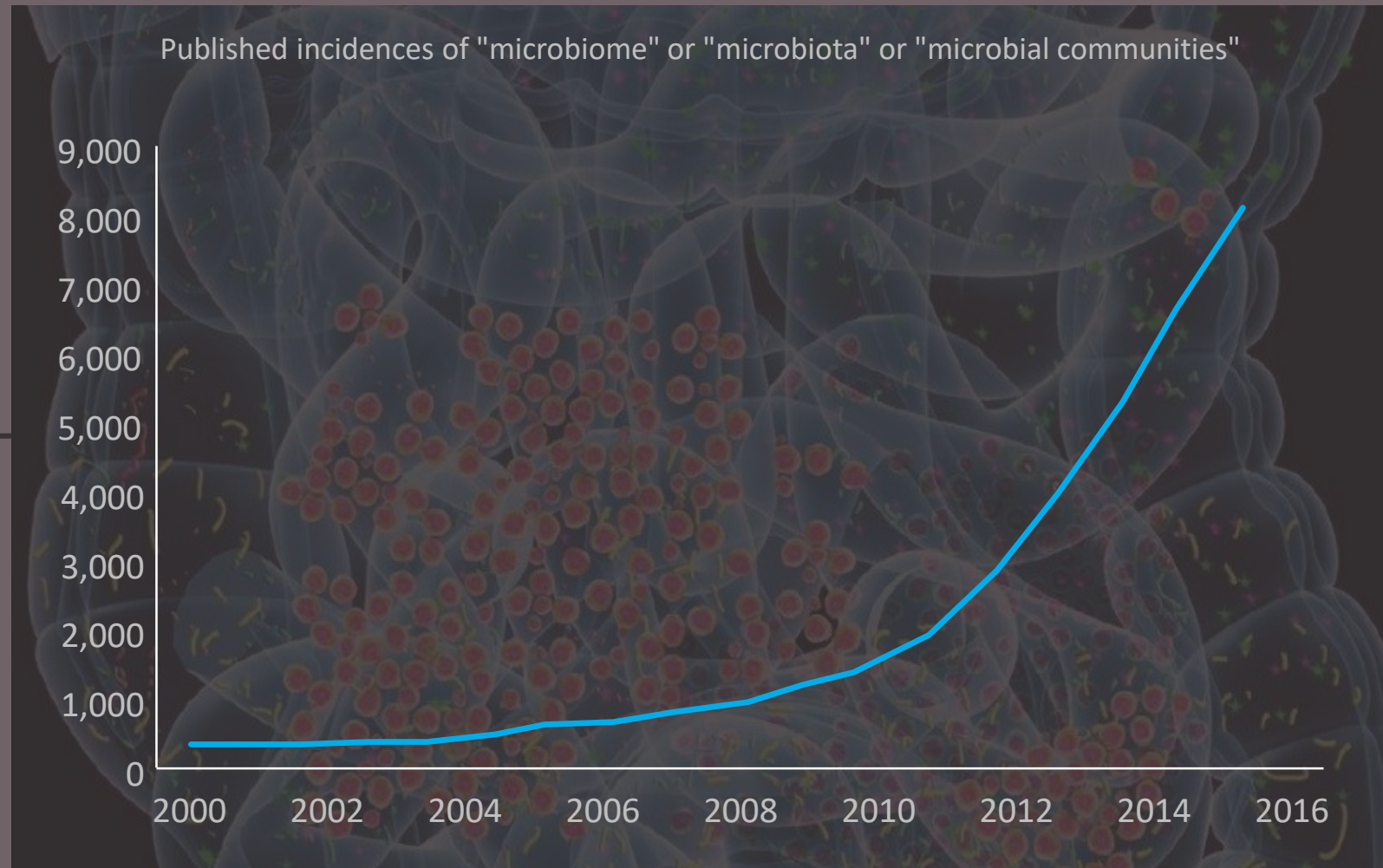
While sugar intake far exceeds recommended amounts, trends suggest a gradual shift away from its consumption in the US



Source: USDA ERS FADS; NPD Group, RBC Capital Markets, UK Business Insiders, NPD Group

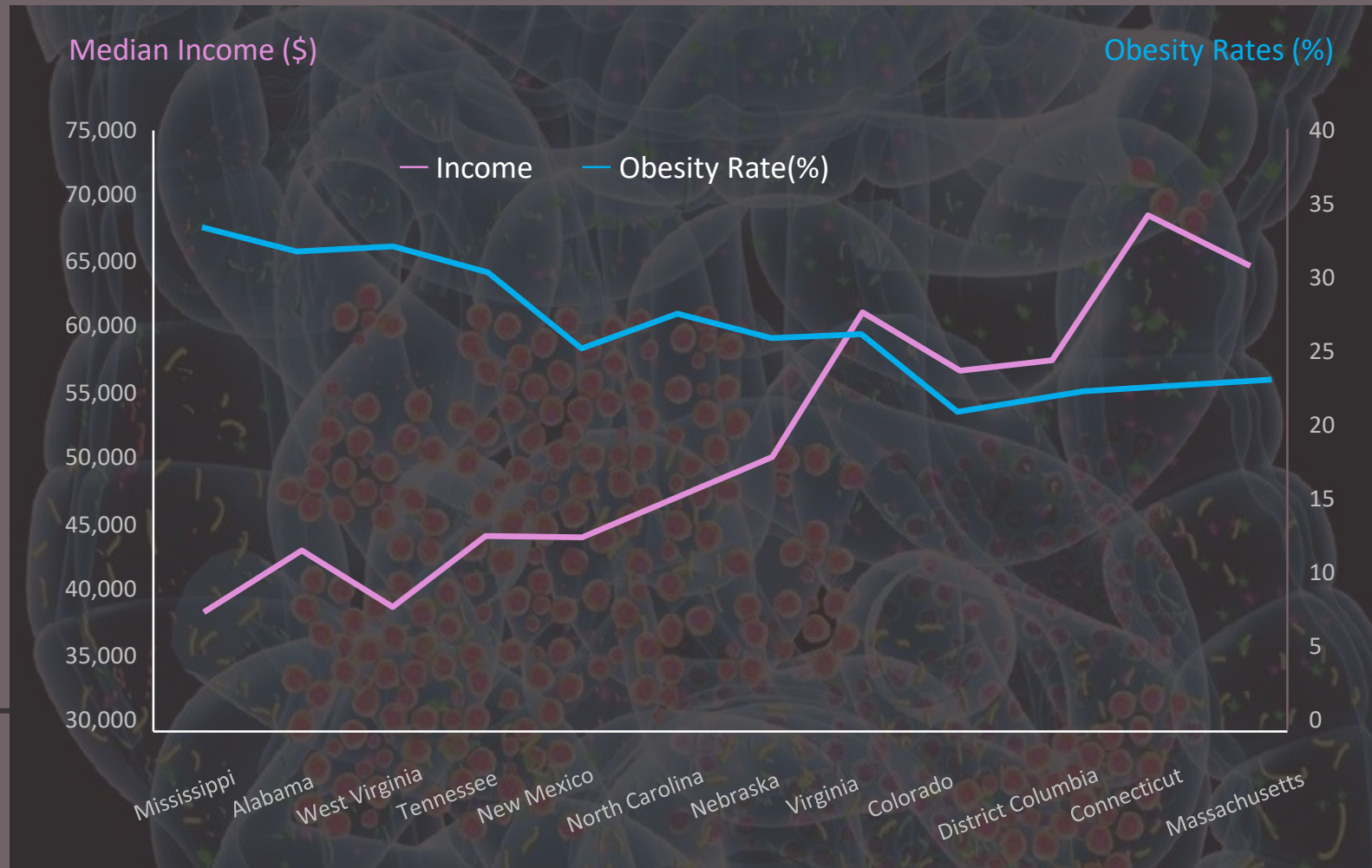
Consumers are forging their own nutritional diets, with increased focus on microorganisms and health

There is an increasing focus on understanding the role of the microbiome in human development, immunity and nutrition



Consumers are also forging their own nutritional diets, with increased focus on microorganisms and health

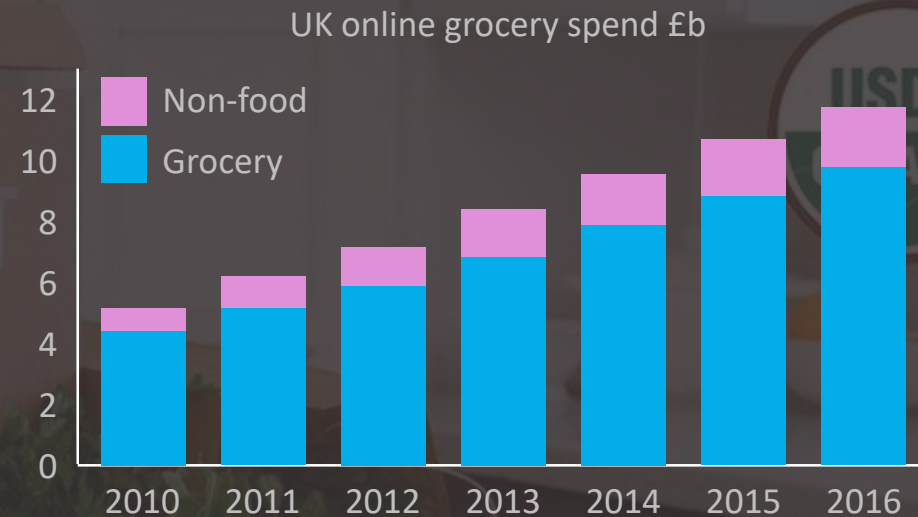
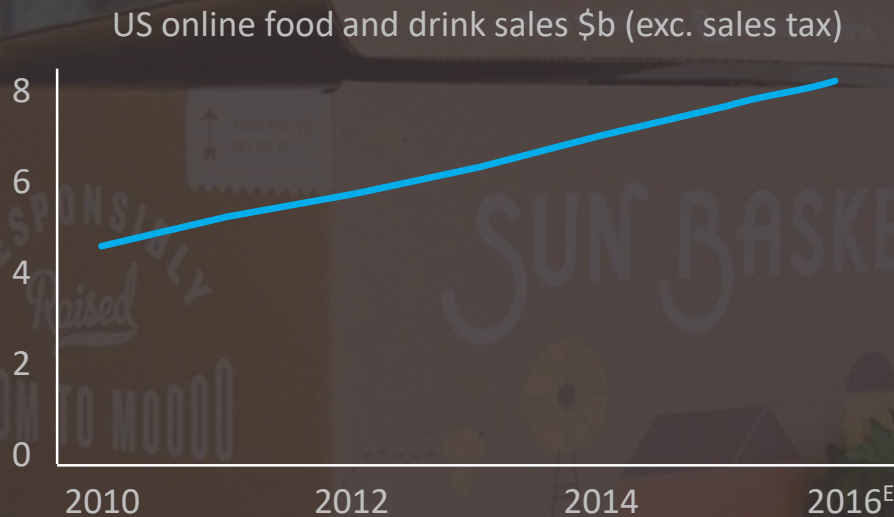
However, health inequities linked to socioeconomic status remain pervasive and still need to be redressed



Traditional bricks-and-mortar shops are making way for online options offering logistical and operational efficiencies



The online grocery market continues to gain scale, reducing the need for individual store trips

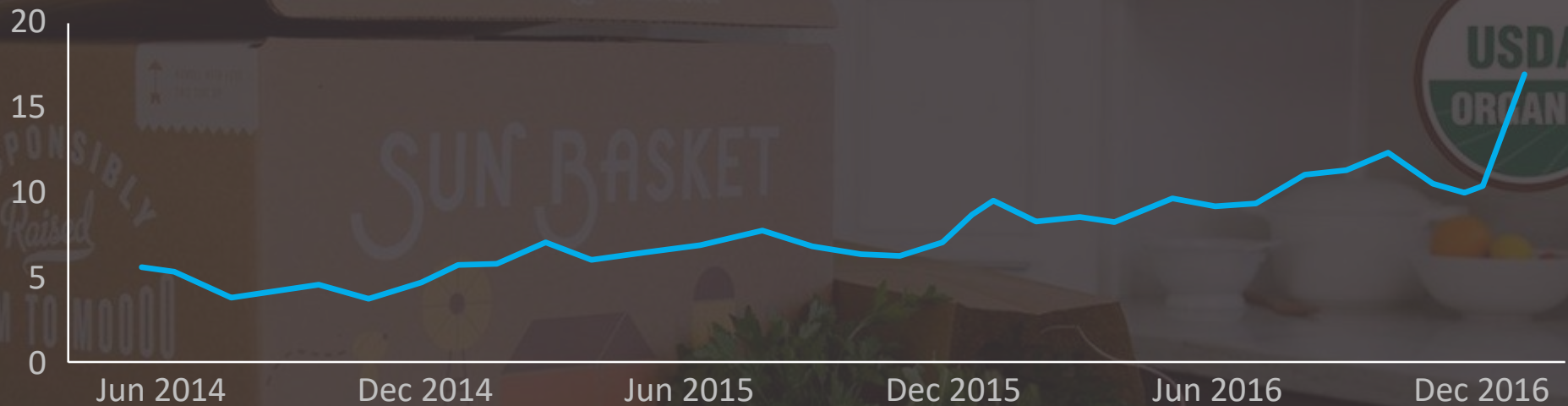


Traditional bricks-and-mortar shops are making way for online options offering logistical and operational efficiencies



Meal-kit offerings and online retailers such as Amazon will continue to drive online growth

Number of visits to sites offering food-subscription boxes (m), US



Traditional bricks-and-mortar shops are making way for online options offering logistical and operational efficiencies



These new models of cooking at home are rooted in a drive towards enhanced efficiencies and a desire to reduce the levels of waste associated with food consumption



While the USDA suggests grocery stores in the US throw out 10.5% of their food, Blue Apron's facility discarded 5.5%



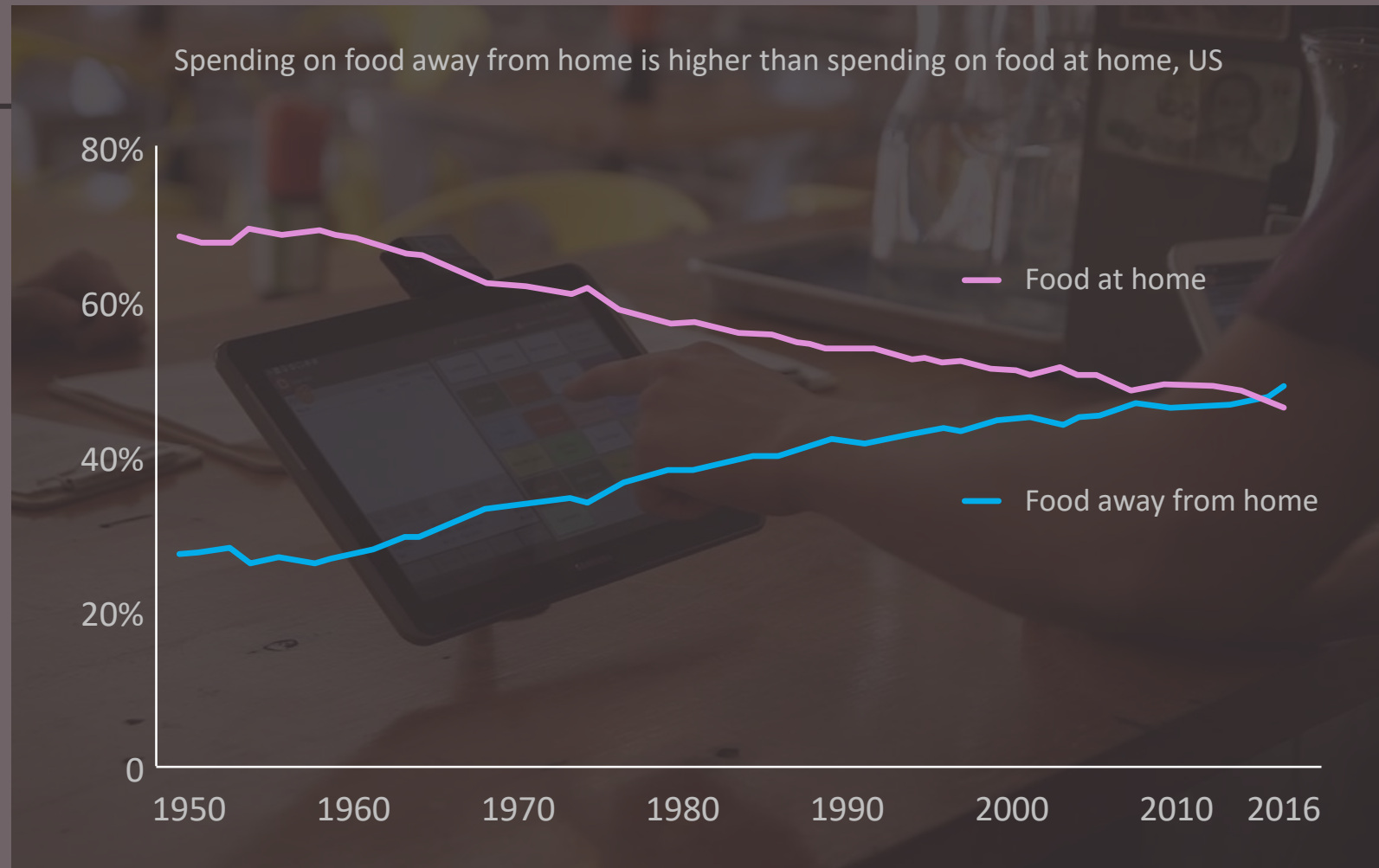
Cooks threw out 7.6% of the food in Blue Apron kits, relative to an estimated 23.9% to make the same meal otherwise



In 2016, Sun Basket launched one of the first 100% recyclable and compostable packaging solutions for the meal-kit industry

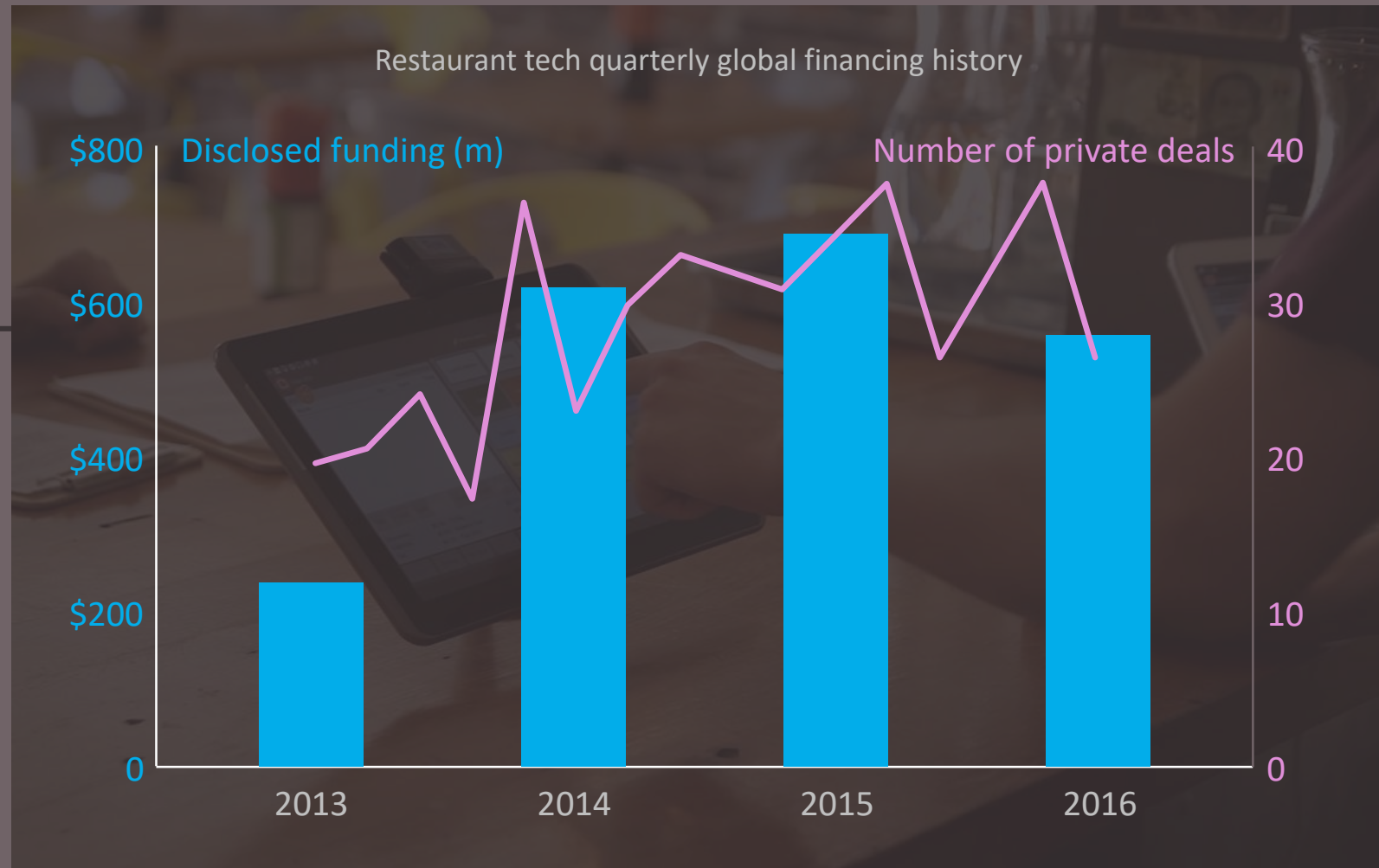
Technological innovations in the restaurant industry are making it more sustainable to eat away from home

As consumers increase their eating habits away from the home, there is need for innovation and improvement in the restaurant industry



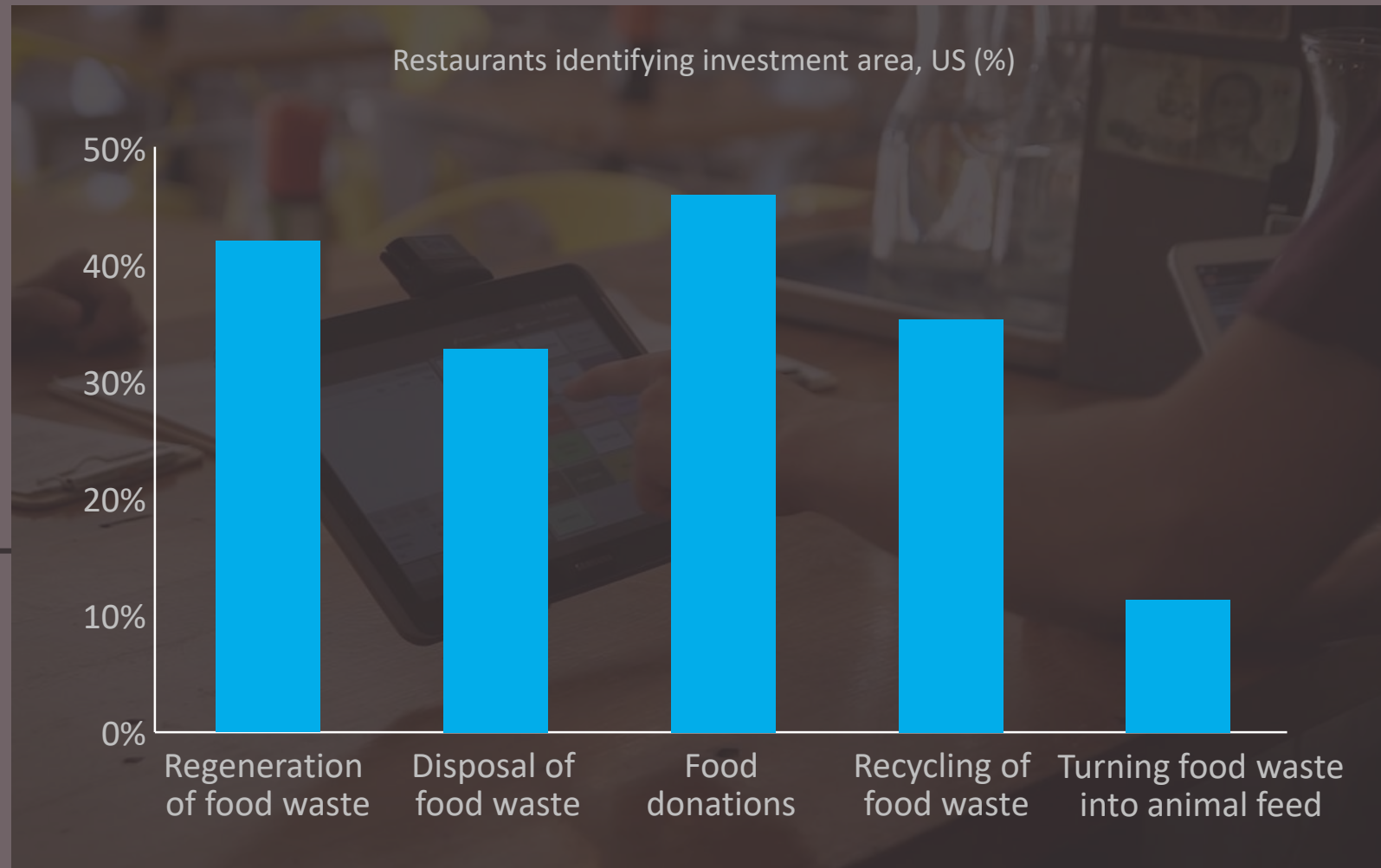
Technological innovations in the restaurant industry are making it more sustainable to eat away from home

Investment in restaurant innovation enables restaurants to optimise operations and reduce food waste



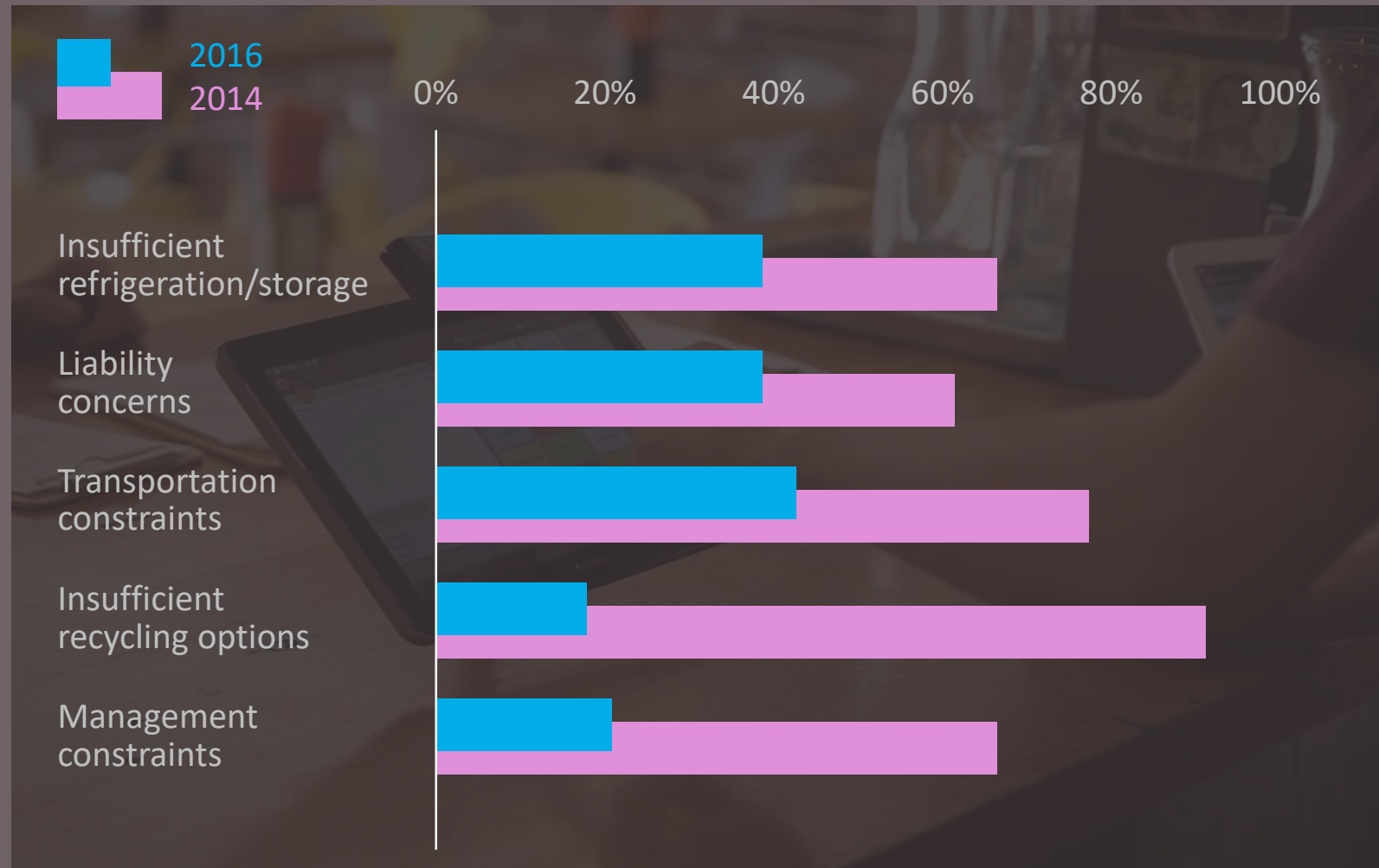
Technological innovations in the restaurant industry are making it more sustainable to eat away from home

Restaurants say that they are committed to investment in reducing food waste across their supply chains



Technological innovations in the restaurant industry are making it more sustainable to eat away from home

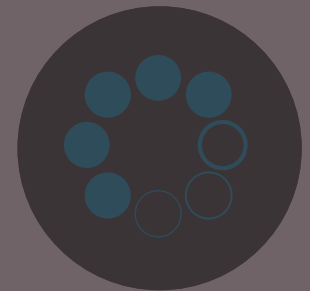
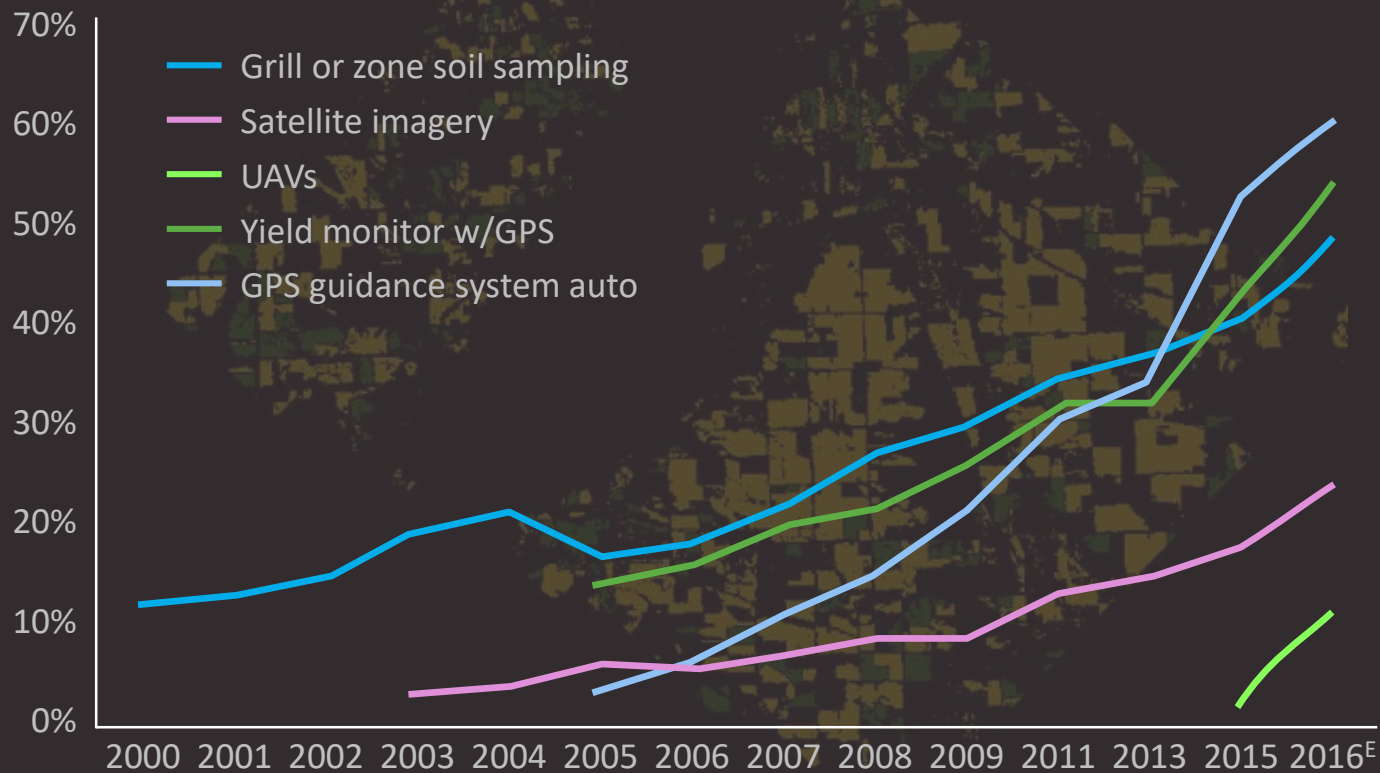
And perceived barriers to repurposing of food waste in US restaurants have also seen significant reduction over time



Precision services, facilitated through the use of drones, have become a critical part of agriculture

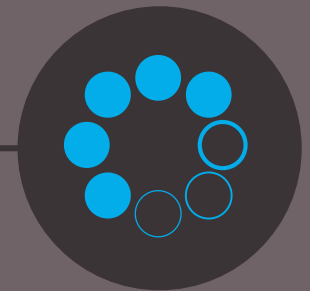
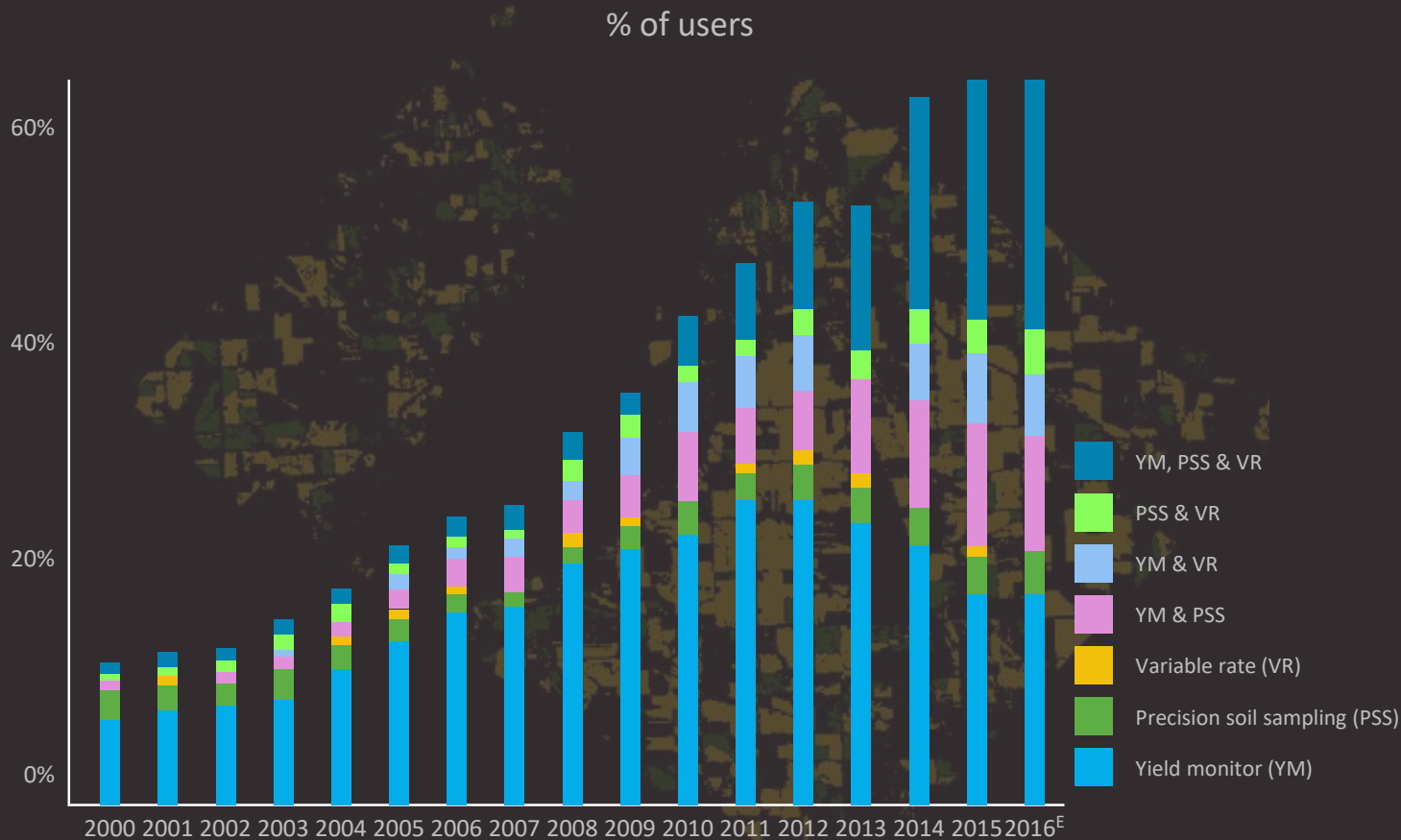
The percentage of market area using precision-agricultural services is getting larger...

Average % of market area



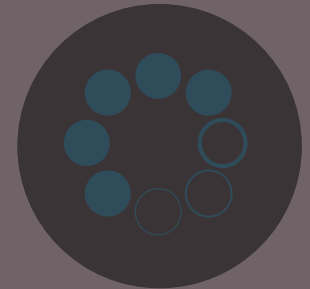
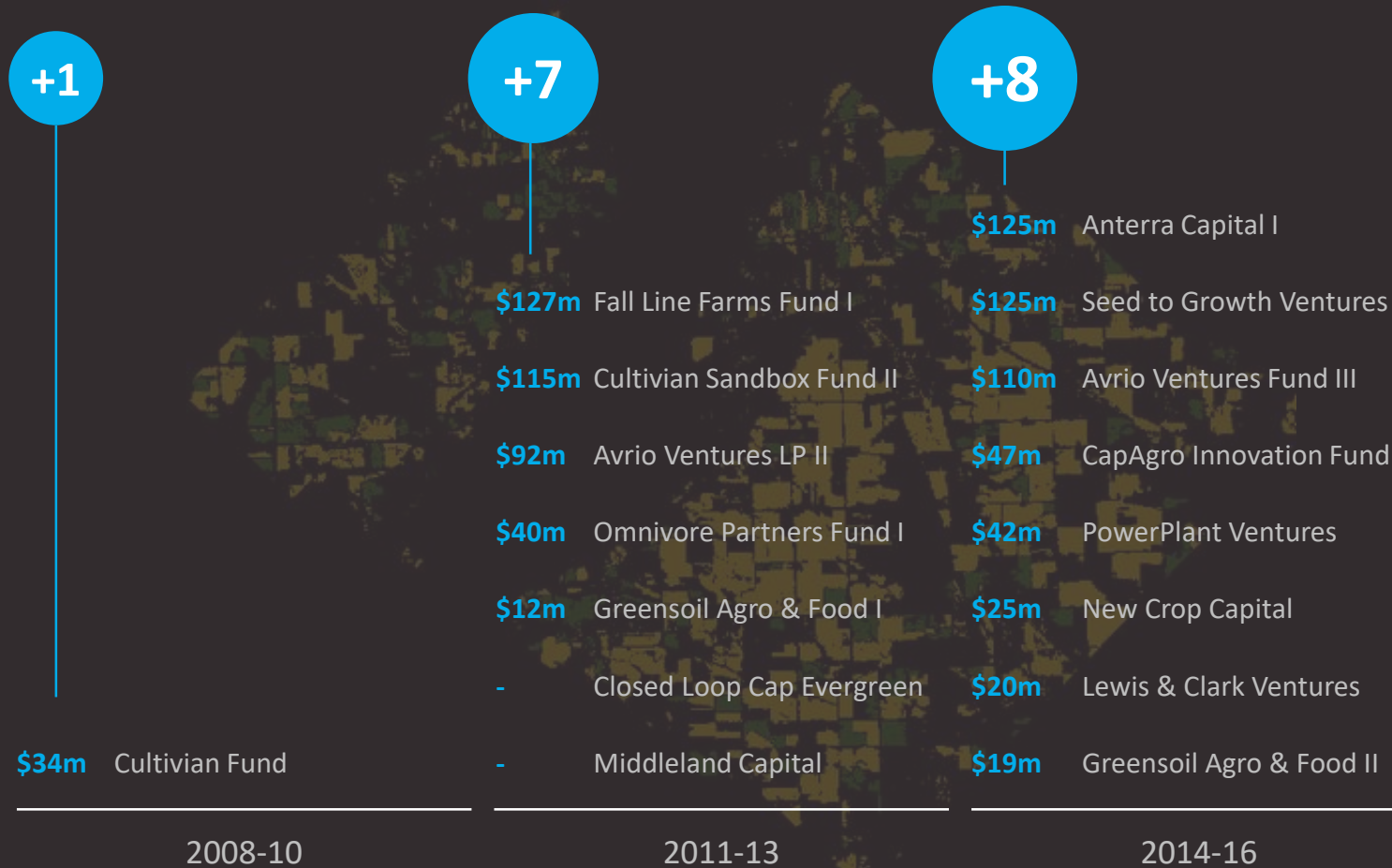
Precision services, facilitated through the use of drones, have become a critical part of agriculture

Users are increasingly diversifying the precision services employed



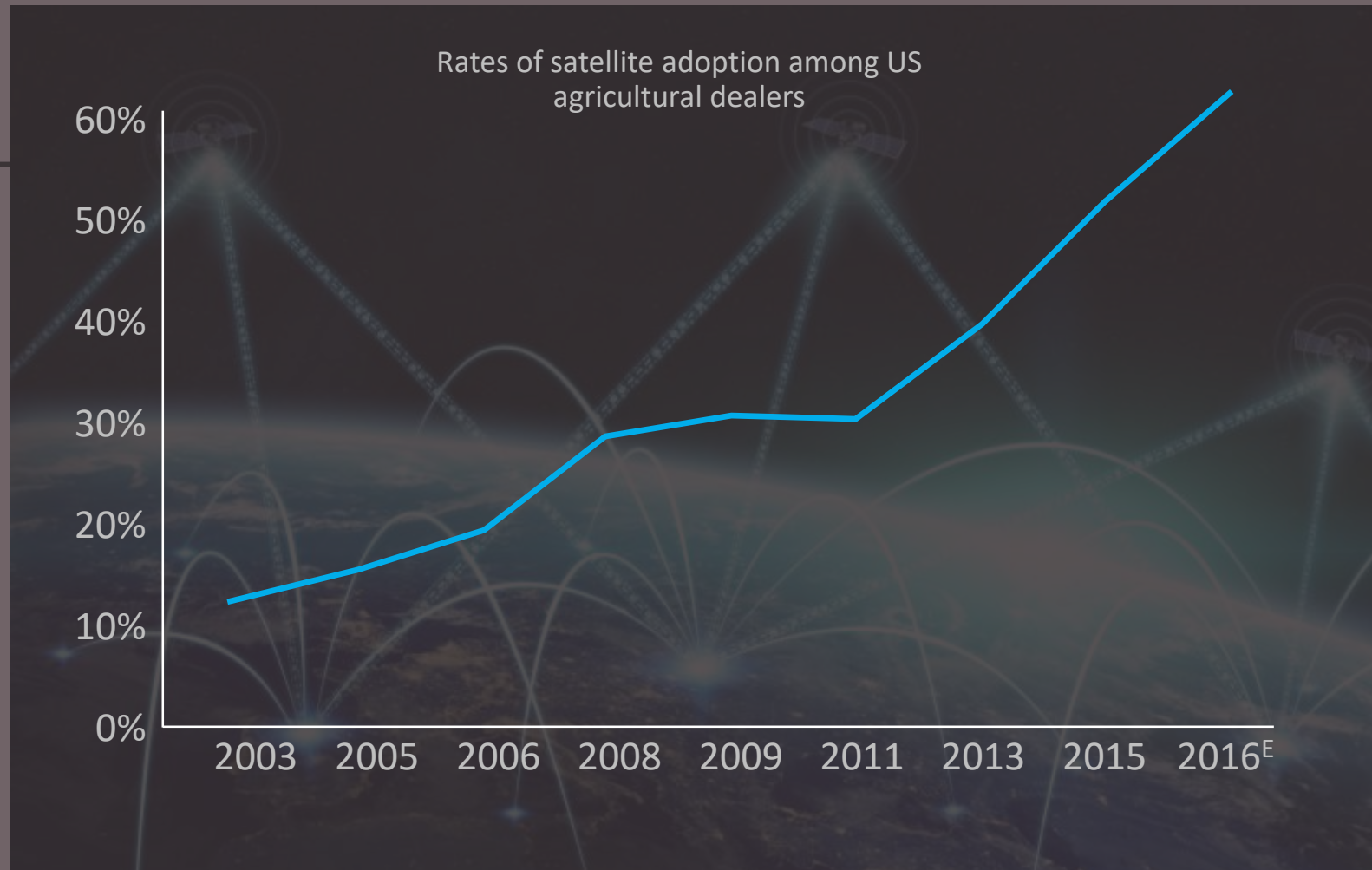
Precision services, facilitated through the use of drones, have become a critical part of agriculture

The scaling opportunity set in AgTech is evidenced through the emergence of AgTech-focused investment funds



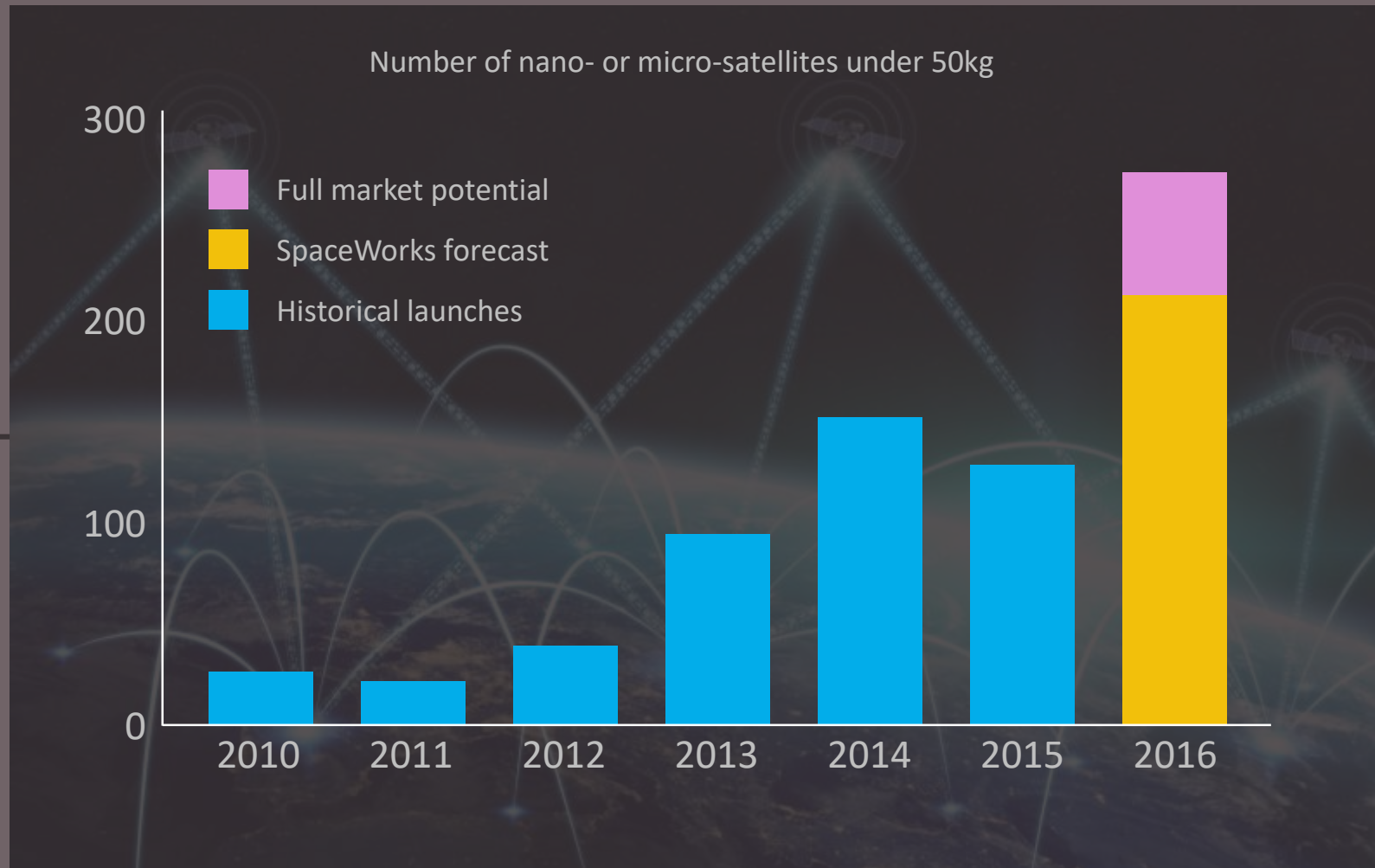
Earth observation is also becoming a core part of how we understand the world

The adoption rate of satellite use has increased to over 50% amongst US agriculture dealers



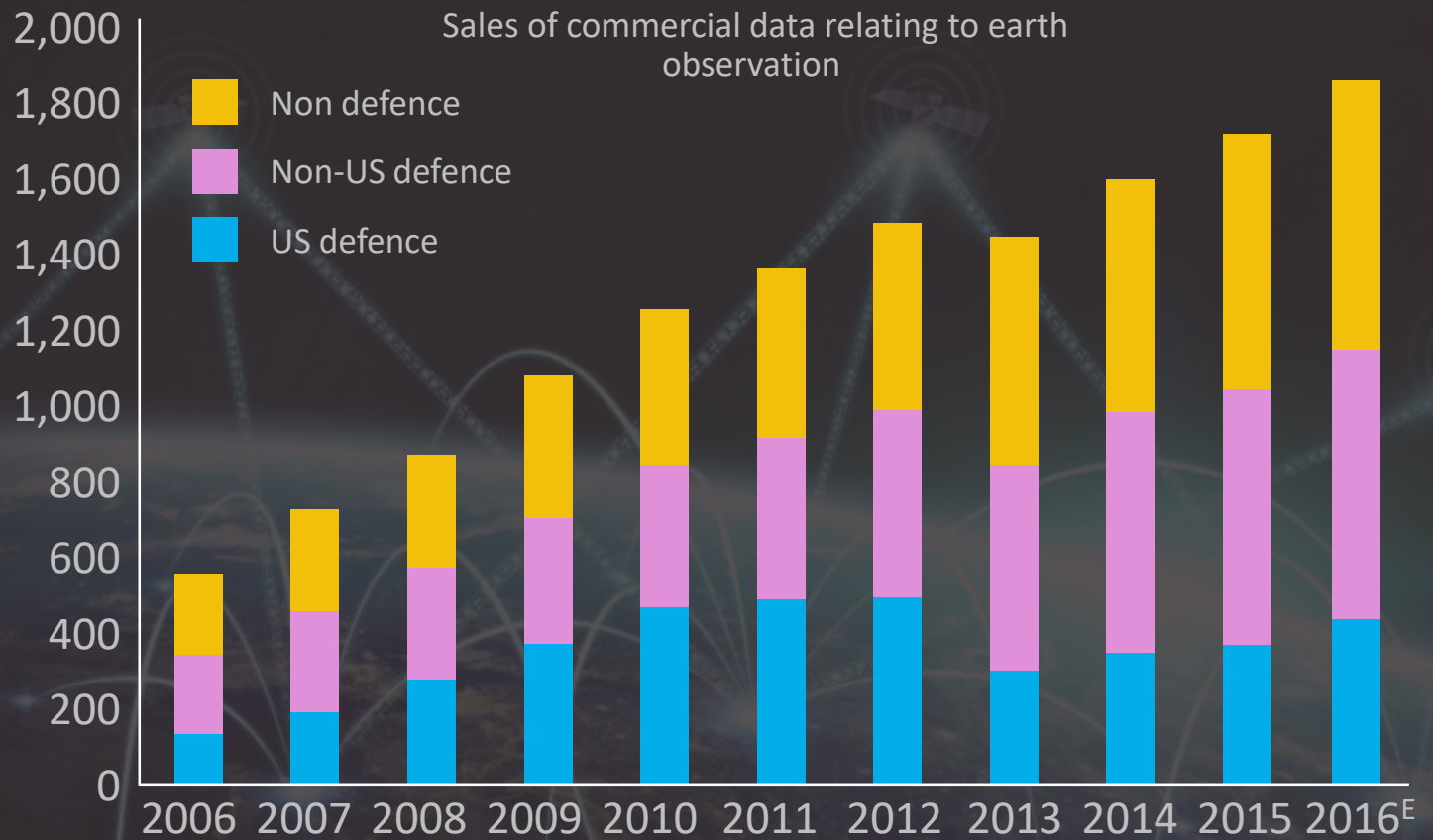
Earth observation is also becoming a core part of how we understand the world

The launch of microsatellites has proliferated over time



Earth observation is also becoming a core part of how we understand the world

The market for commercial data related to earth observation has also increased significantly in the US, including outside of a defence focus



Food systems trends to monitor:



Evidence of a fully informed customer making decisions based on fact over marketing



Key agricultural demarcations of improvement including reduction in topsoil depletion, etc.



Improvements around food waste, both at home and at restaurants



Proof that health inequities associated with food consumption are being reduced



...among others



WELLBEING

We believe a sustainable consideration of wellbeing is inclusive of:



Increasing focus on physical health



Collective awareness of the importance of holistic wellbeing



Workplace wellness embraced as a driver of retention and performance



Ubiquitous healthcare services enabled by digitalisation

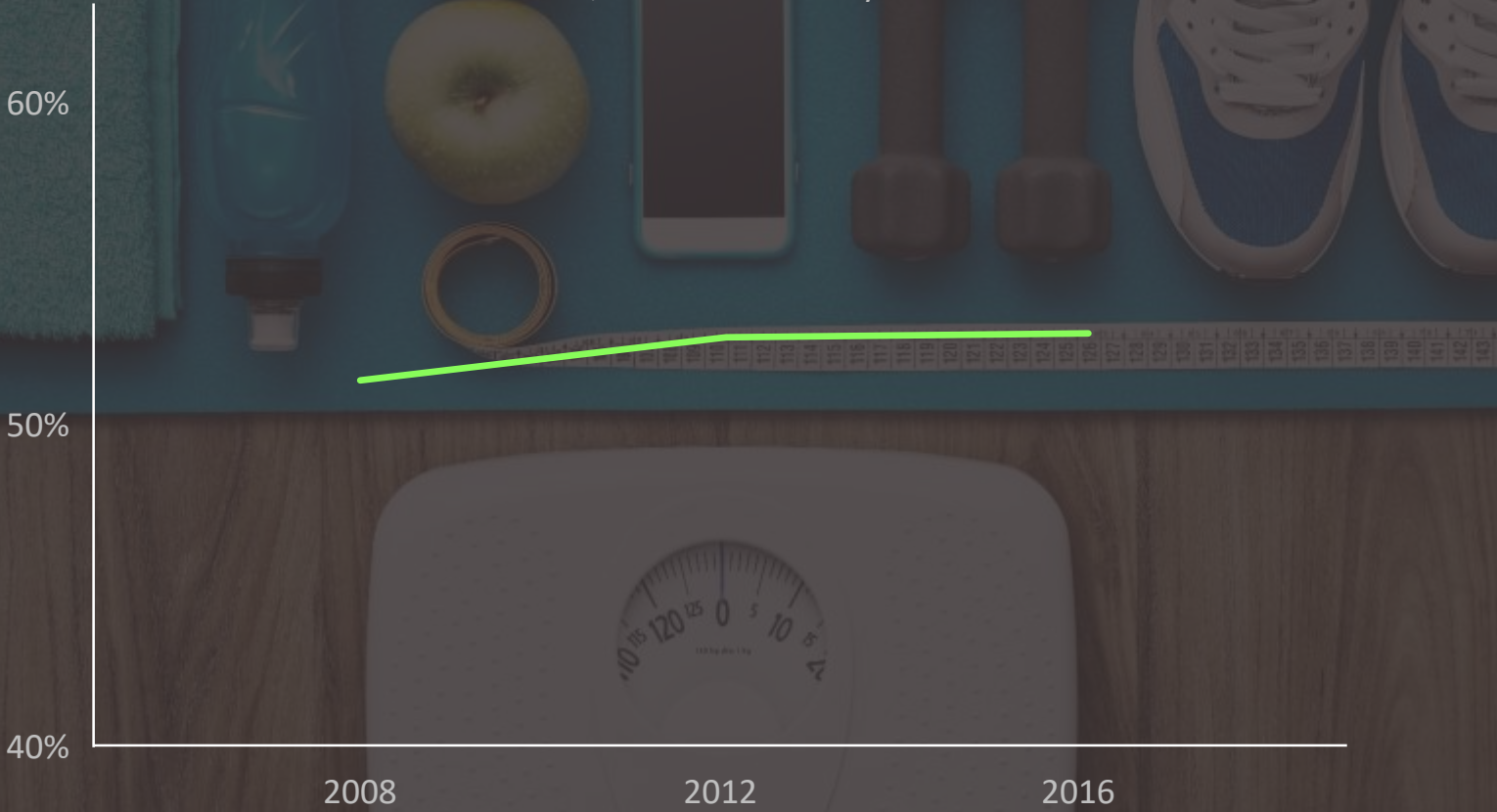


Growing global access to basic needs and opportunities

People are increasingly focused on physical fitness

The number of people in the US who are exercising on a regular basis has seen a marginal uptick

% of Americans who report they exercised for 30 minutes or more, three or more days in the last week

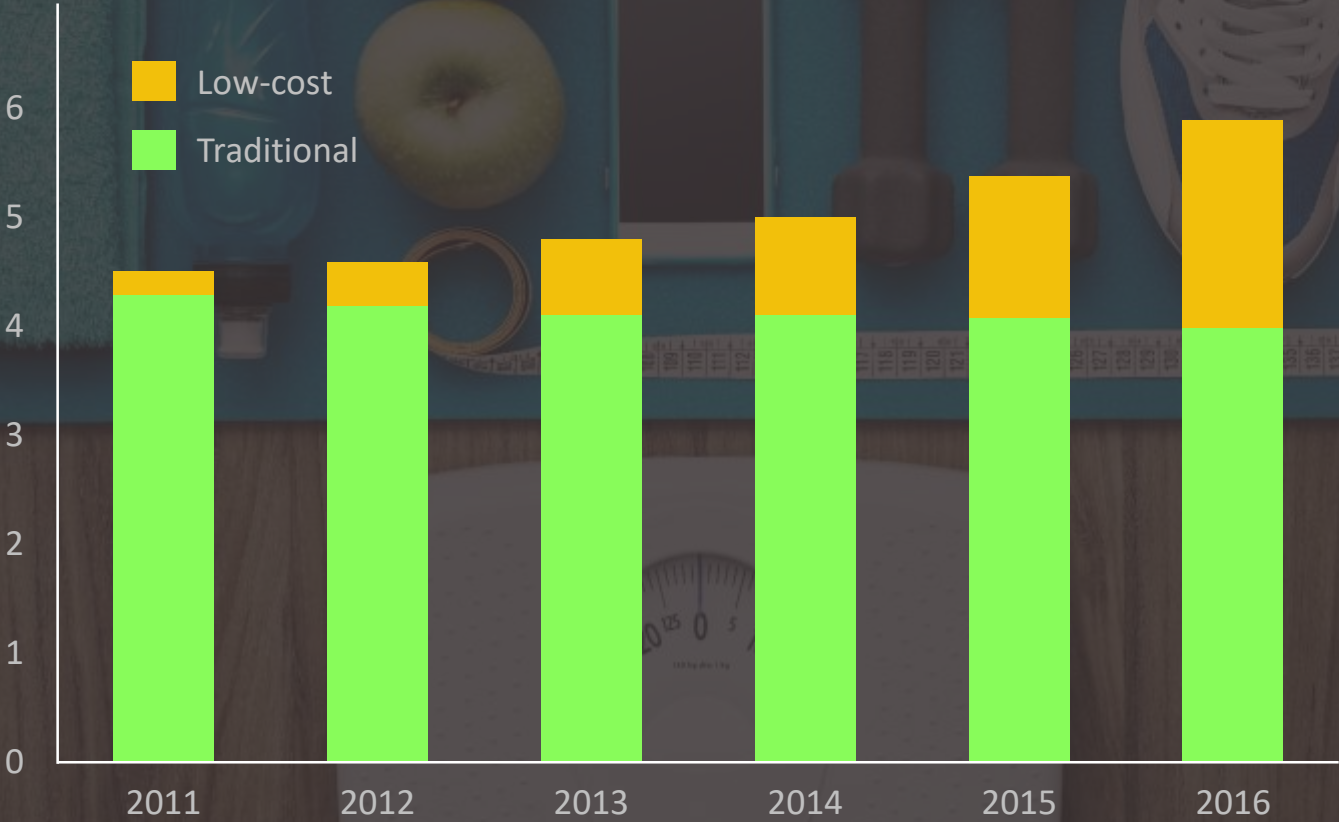


Source: Gallup-Healthways Well-Being Index

People are increasingly focused on physical fitness

This is reflected in infrastructure growth around physical health

Number of health clubs (thousands) in the UK



Source: Leisure Database Company/ Berenberg

People are increasingly focused on physical fitness

Further evidence of this trend is manifest in increased consumer spending on athleisure apparel

Year-on-year growth

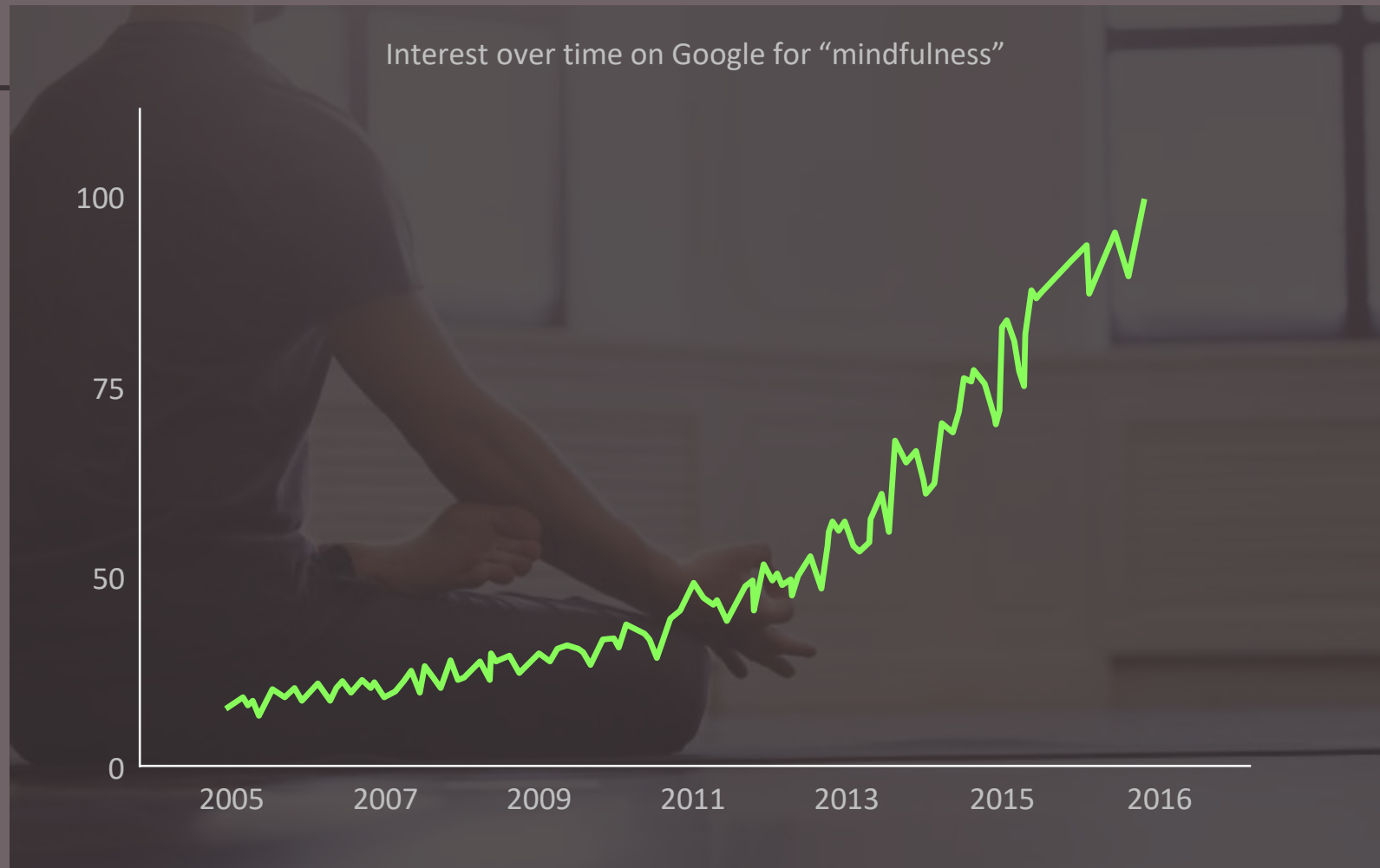
Apparel and footwear by product category, global



Source: Euromonitor

Awareness of the importance of holistic wellbeing is growing

More people are interested in mental health and wellbeing

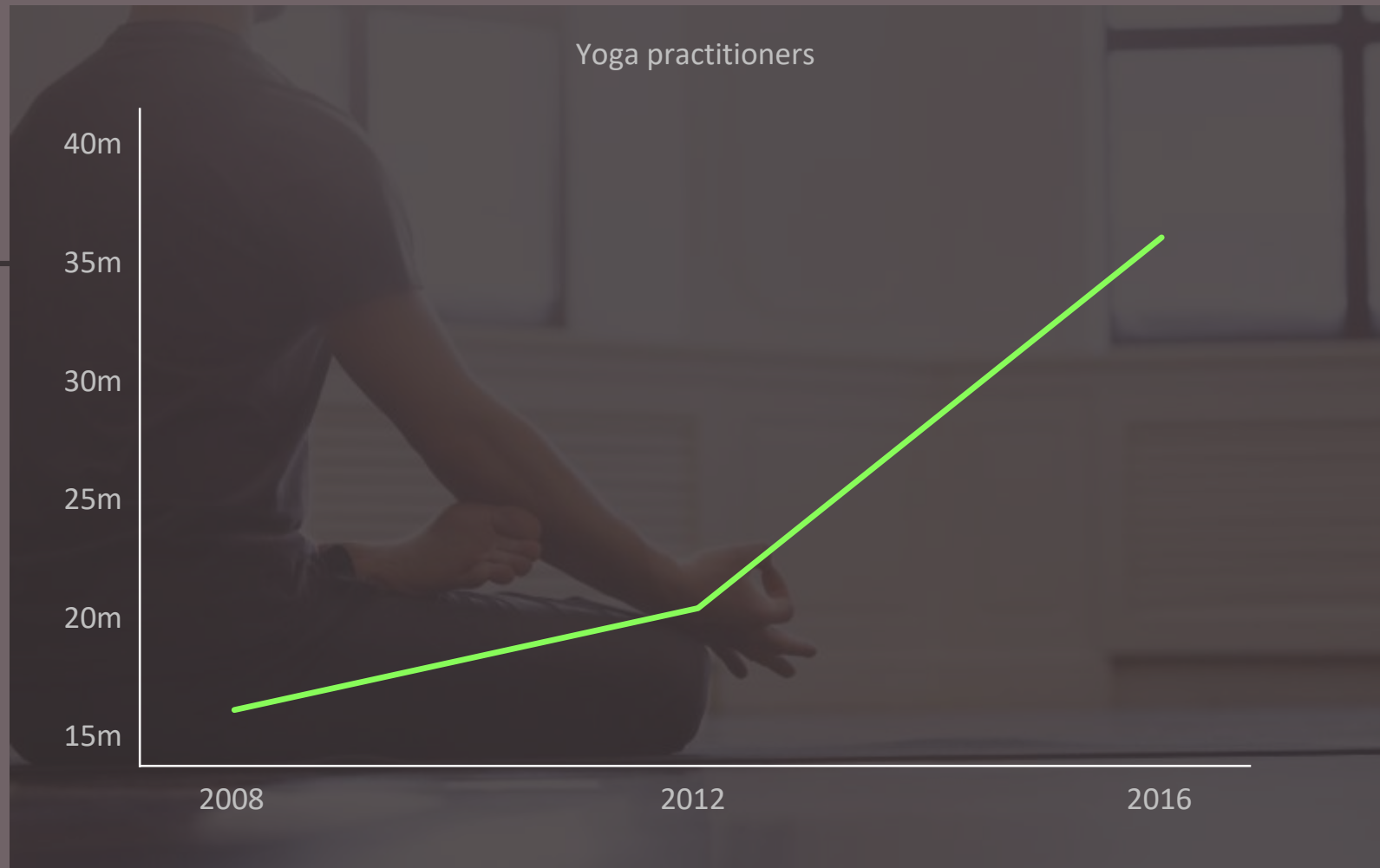


Source: Google Trends

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Awareness of the importance of holistic wellbeing is growing

The number of yoga practitioners in the US is increasing rapidly as people are drawn to both its physical and mental benefits

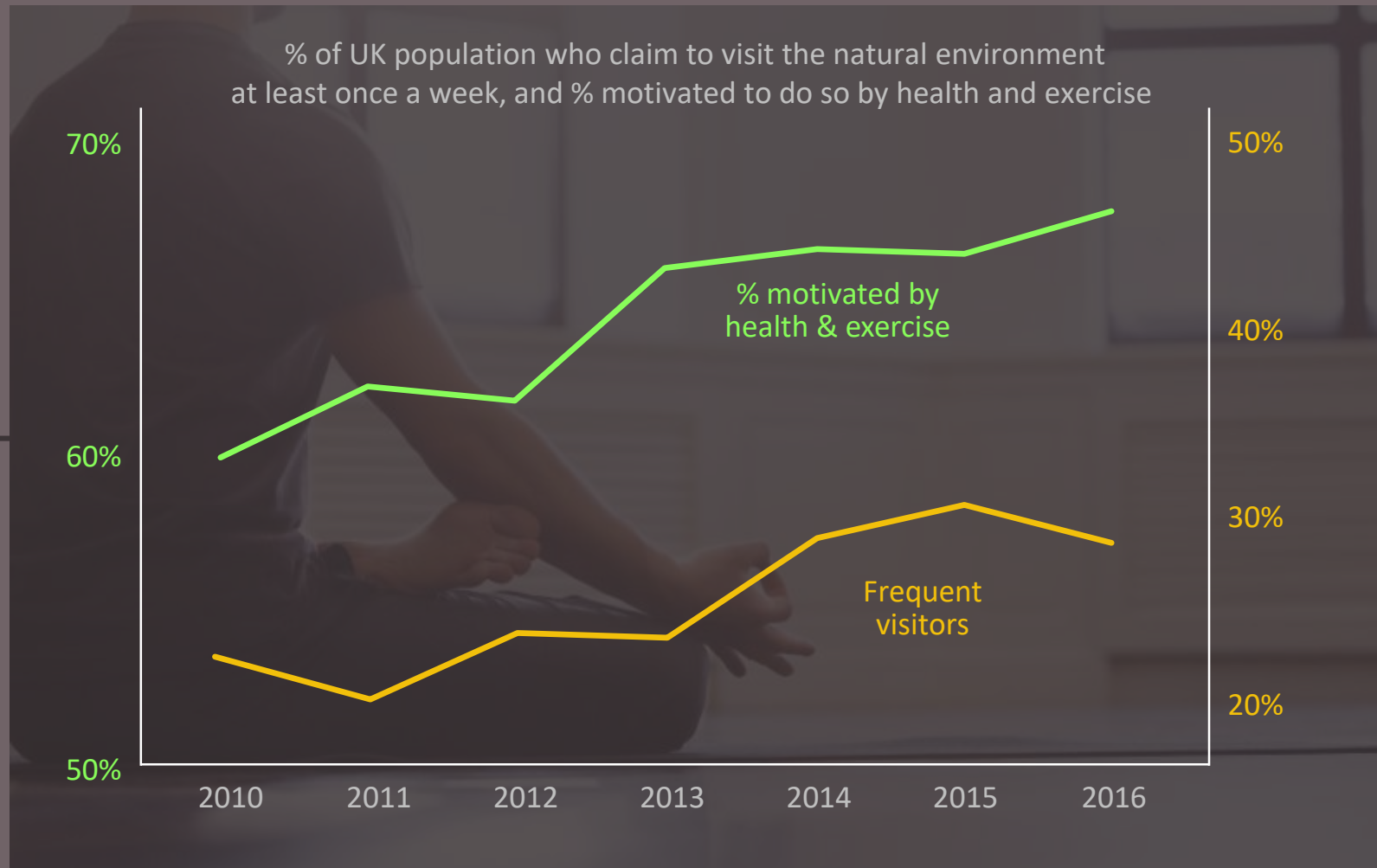


Source: IPSOS Public Affairs 2016, USA

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Awareness of the importance of holistic wellbeing is growing

Wellness benefits of engaging with the natural environment are better understood



Source: 2016 Monitor of Engagement with the Natural Environment, UK

*Visits to outside spaces in and around cities, countryside and coastlines, such as parks, cycle-ways, forests, etc.

© Generation Investment Management LLP

Awareness of the importance of holistic wellbeing is growing

Travel and free time are increasingly being used as an opportunity to focus on one's wellbeing

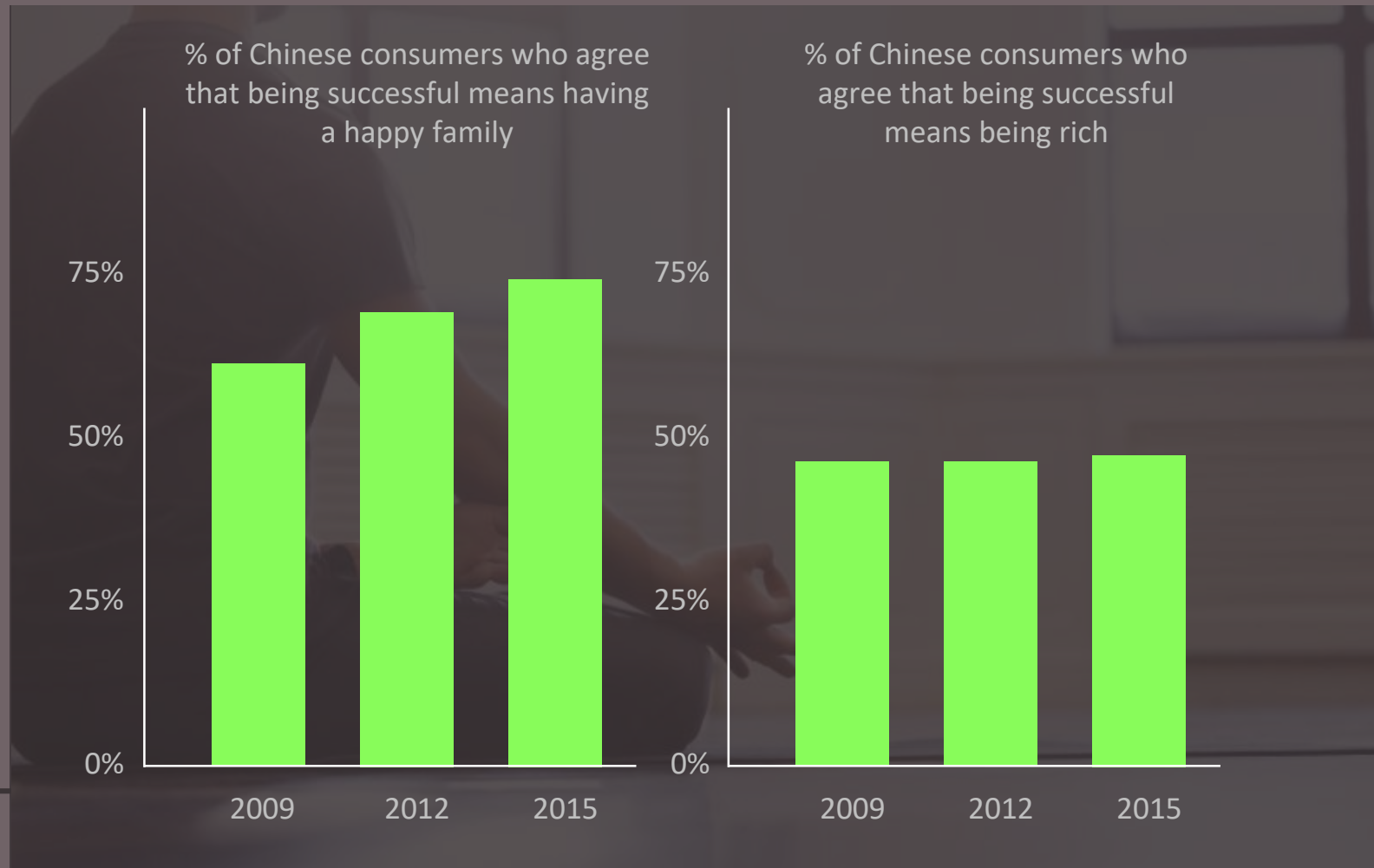


Source: Global Wellness Institute

*Wellness tourism is defined as travel for the purpose of promoting health and wellbeing through physical, psychological or spiritual activities

Awareness of the importance of holistic wellbeing is growing

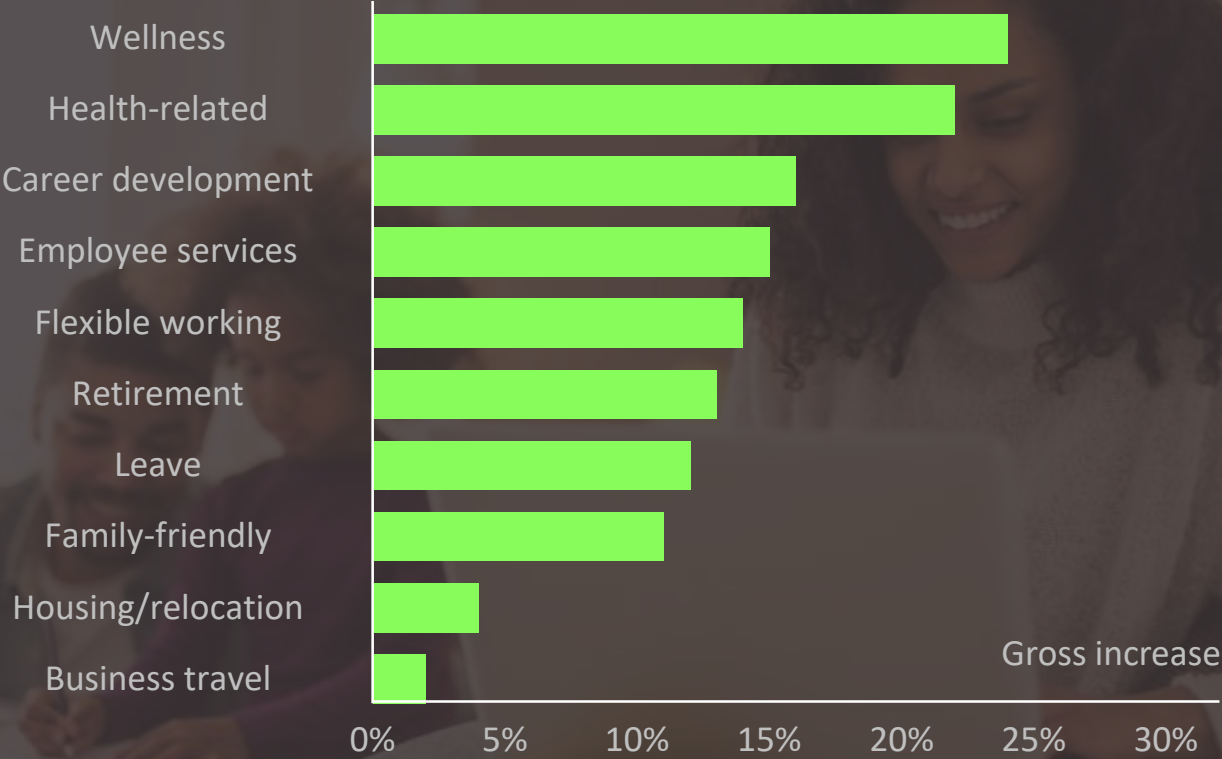
The importance of strong social networks is more appreciated than in the past



Employers increasingly recognise the importance of workplace wellness

More attention and resources are being allocated towards wellbeing benefits for employees

Employers who changed their benefits offering in the past 12 months, 2017



Source: Society for Human Resources Management, 2017 survey of US employers

Employers increasingly recognise the importance of workplace wellness

40% of organisations cite flexible work arrangements as one of their most effective recruiting strategies



Source: Society for Human Resources Management, 2017 survey of US employers

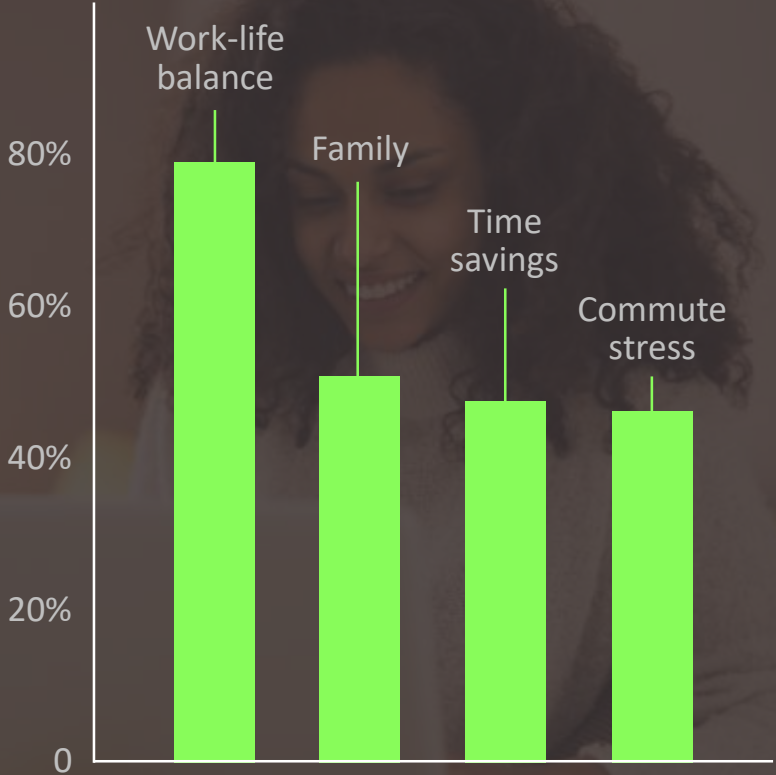
Employers increasingly recognise the importance of workplace wellness

Improvements in flexibility through remote working also has a positive impact on work-life balance

% of workers who have ever telecommuted



Reasons supporting a flexible workforce



Source: Gallup – State of the American Workplace; REPL Group

Employers increasingly recognise the importance of workplace wellness

Employer consideration of wellness provisions is also reflected in office design and infrastructure

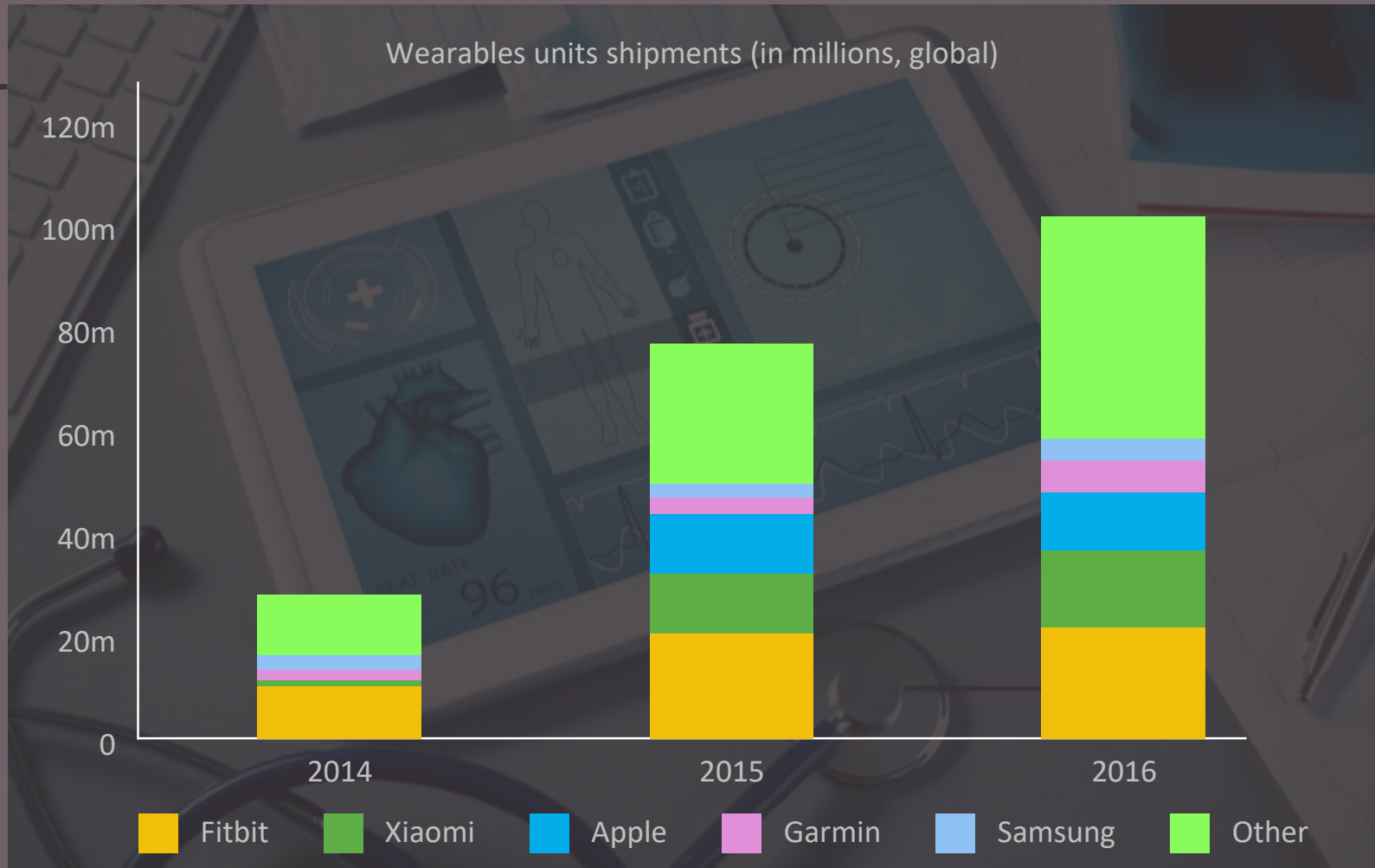
% of employers who offered standing desk as a benefit, US



Source: Society for Human Resources Management, 2017 survey of US employers

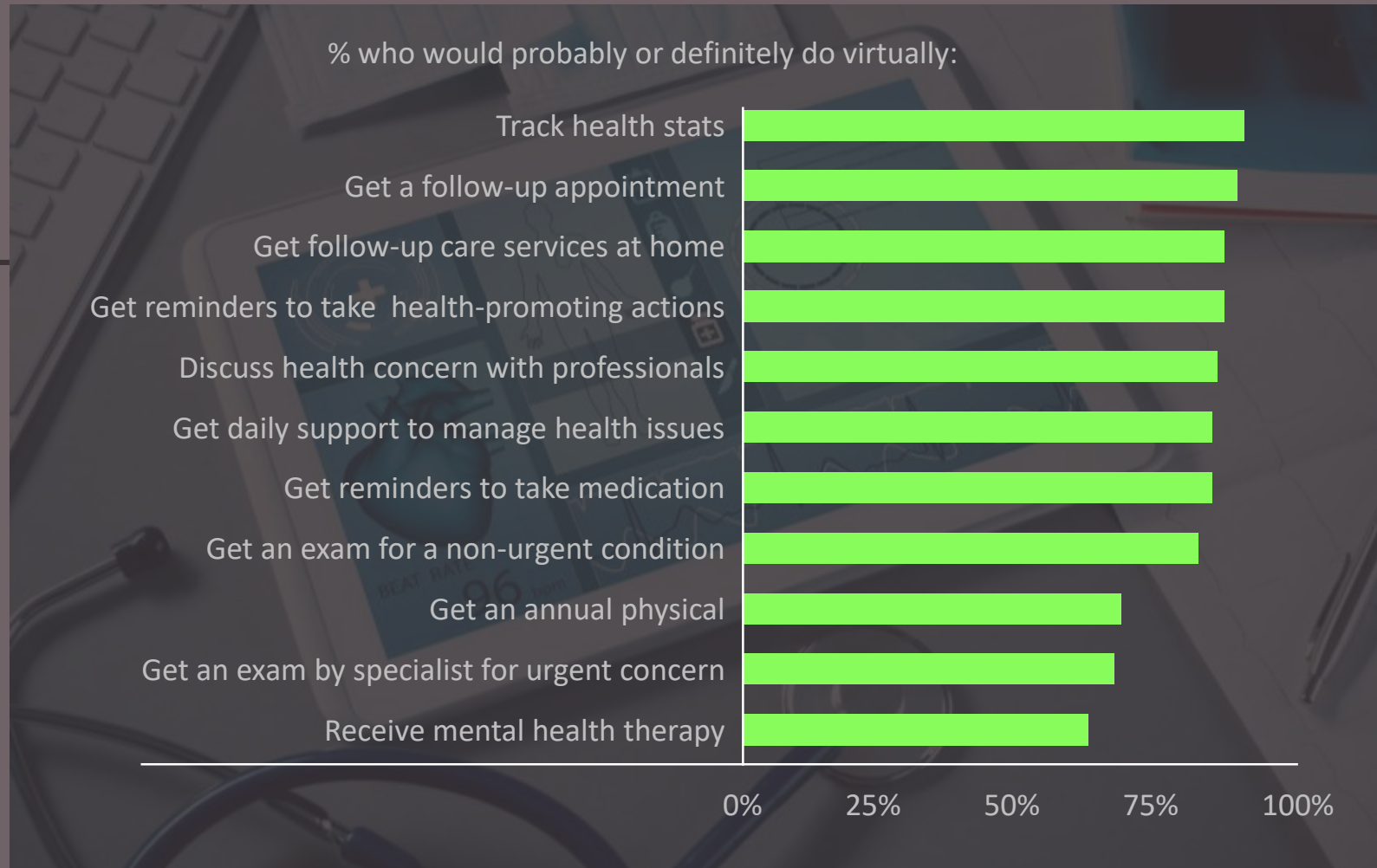
Ubiquitous healthcare services, enabled through technology, help alleviate resource constraints

The desire to monitor health and wellness, and apply metrics to progress, is evidenced in the growing market for consumer wearables



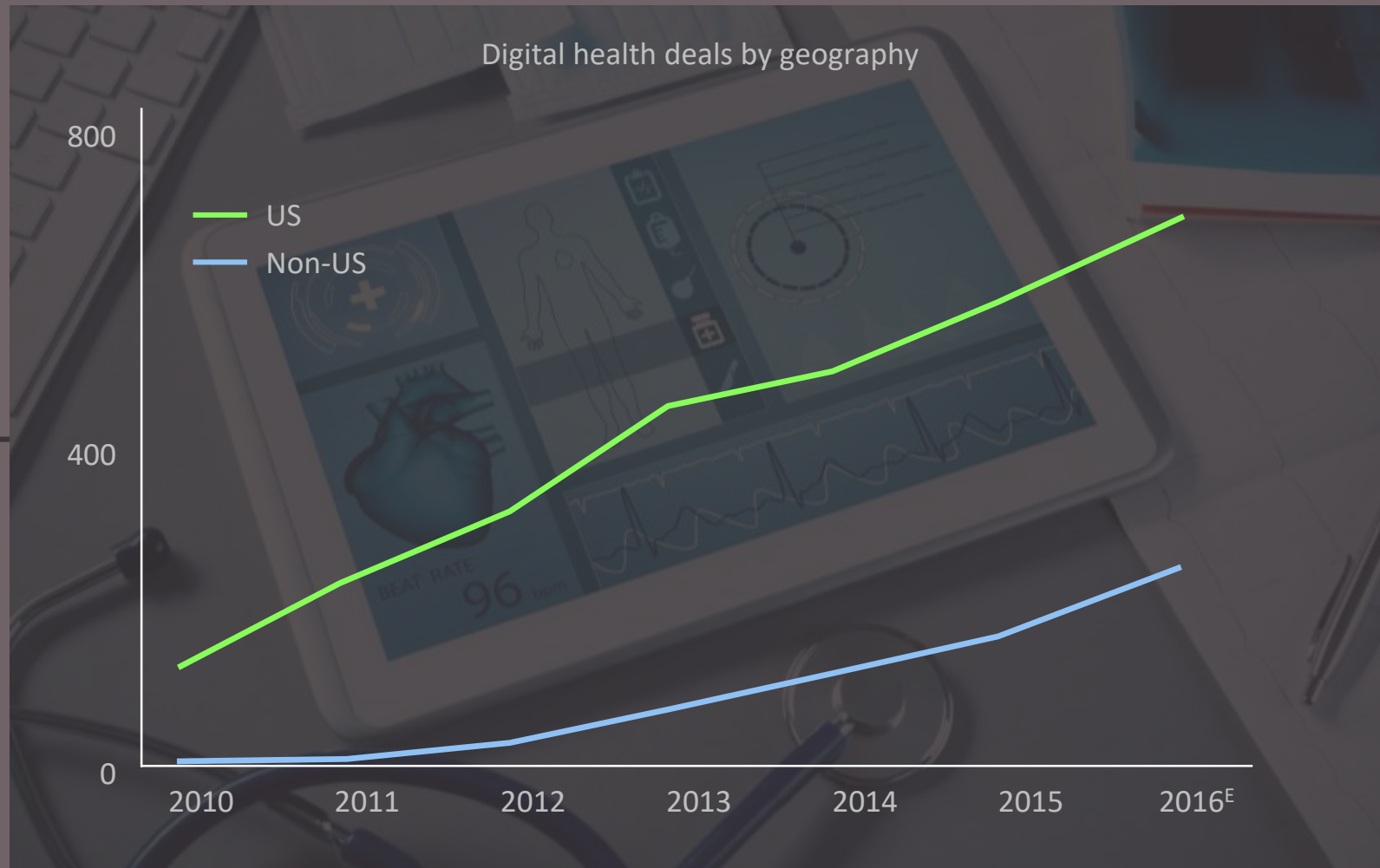
Ubiquitous healthcare services, enabled through technology, help alleviate resource constraints

The digitisation of health provision further enables remote access, which is increasingly receiving consumer buy-in



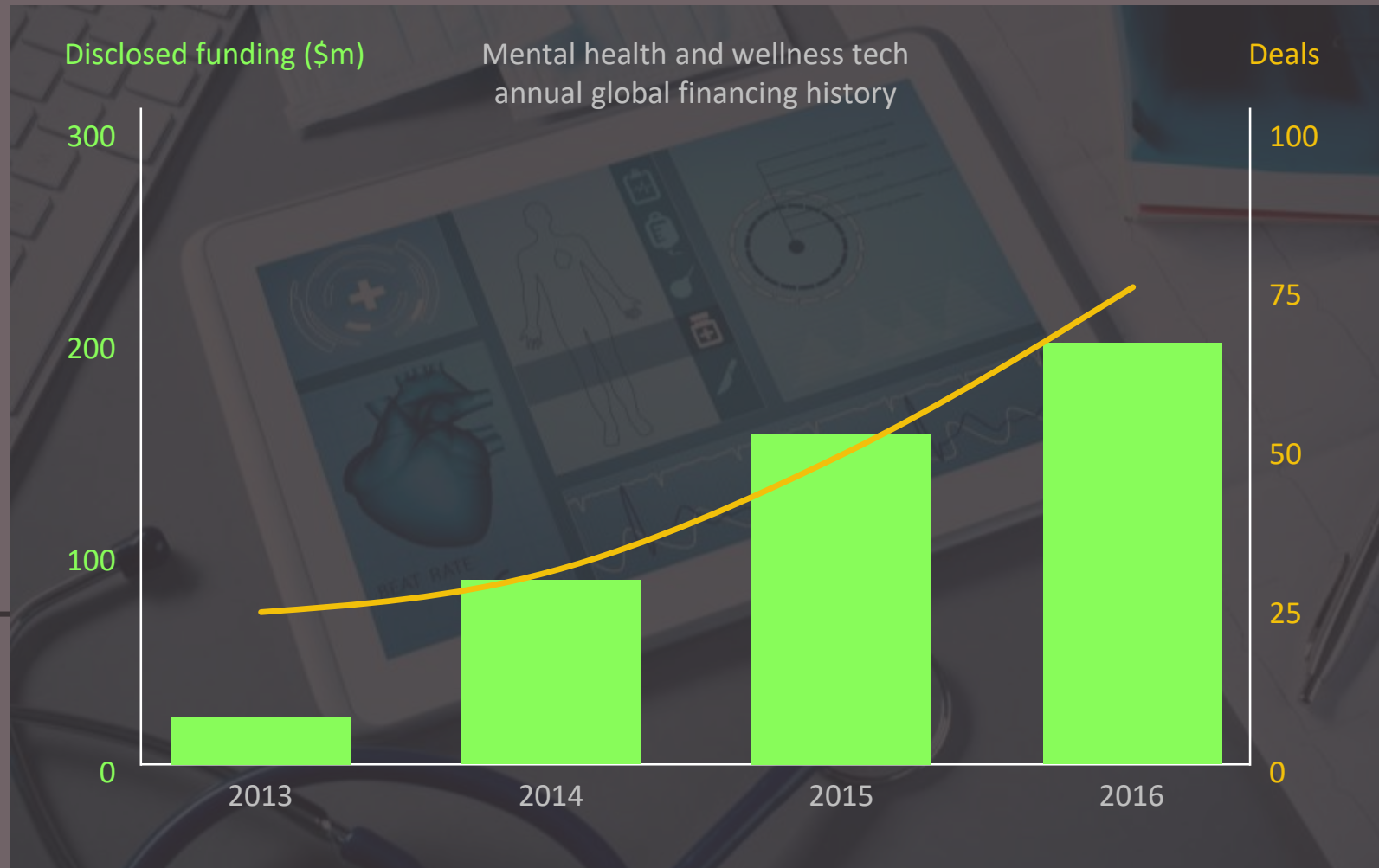
Ubiquitous healthcare services, enabled through technology, help alleviate resource constraints

Capital continues to flow into this new model of healthcare provision



Ubiquitous healthcare services, enabled through technology, help alleviate resource constraints

While mental health in particular is seeing increased investment activity



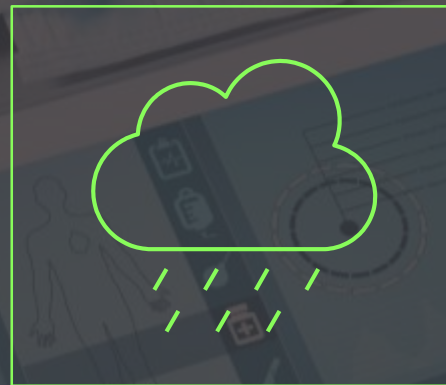
Ubiquitous healthcare services, enabled through technology, help alleviate resource constraints

But innovation and capital allocation will need to accelerate in order to keep up with increasing demands on the global system



350m

Depression alone affects 350 million people and is the single largest contributor to years lived with disability globally



3 out of 4 people suffering from major depression do not receive adequate treatment

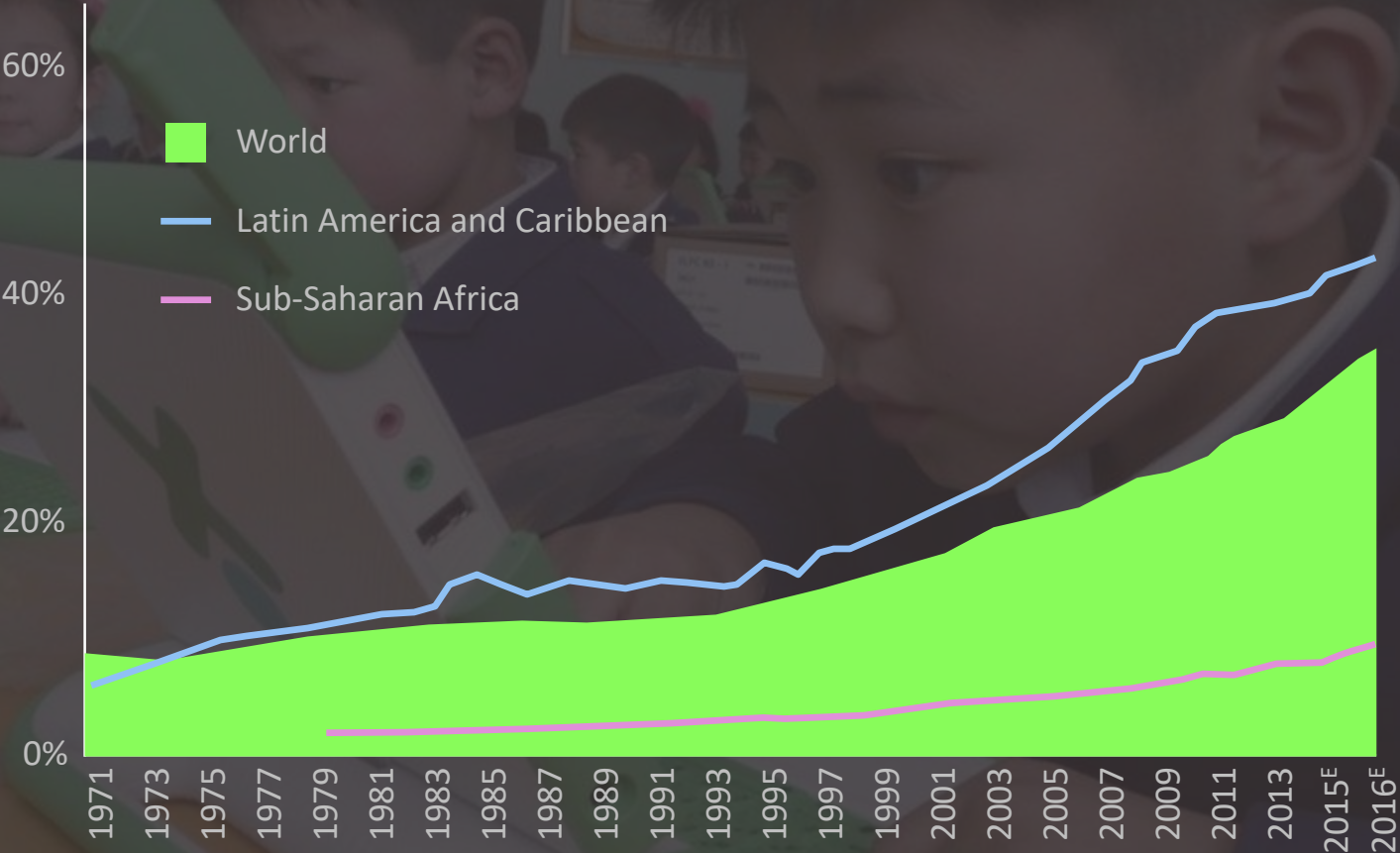
\$1.6tn

Depression is estimated to cost over US \$1.6tn in lost economic output by 2030

Yet improvements in global societal wellbeing are apparent in increased rates of access to basic needs and opportunities

Global educational attainment has seen marked improvement, particularly over the past decade

Gross tertiary enrolment ratio (%)

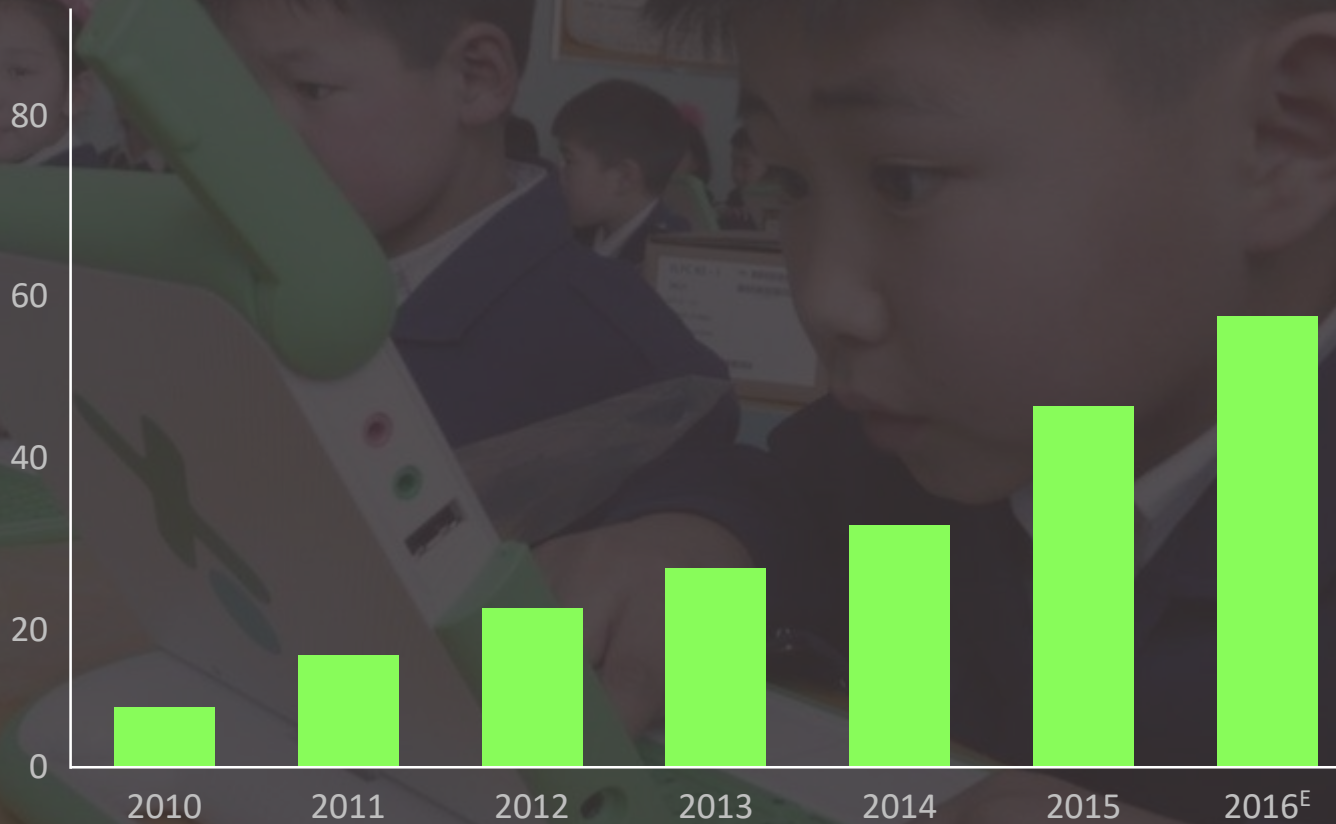


Source: Simon Marginson; UNESCO Note: Data for 1971-79 not available for Sub-Saharan Africa

Yet improvements in global societal wellbeing are apparent in increased rates of access to basic needs and opportunities

Access has improved because of innovations in education provision, including through the emergence of e-learning tools

Number of users of Google apps for education (m), global



Source: Boost eLearning, a Google for Work and Google for Education partner Note: Includes teachers, students and administrators

Yet improvements in global societal wellbeing are apparent in increased rates of access to basic needs and opportunities

In part because of big-data analysis, less developed countries are becoming more financialised

Deposit transaction accounts in World Bank Universal Financial Access (UFA) focus countries (m)

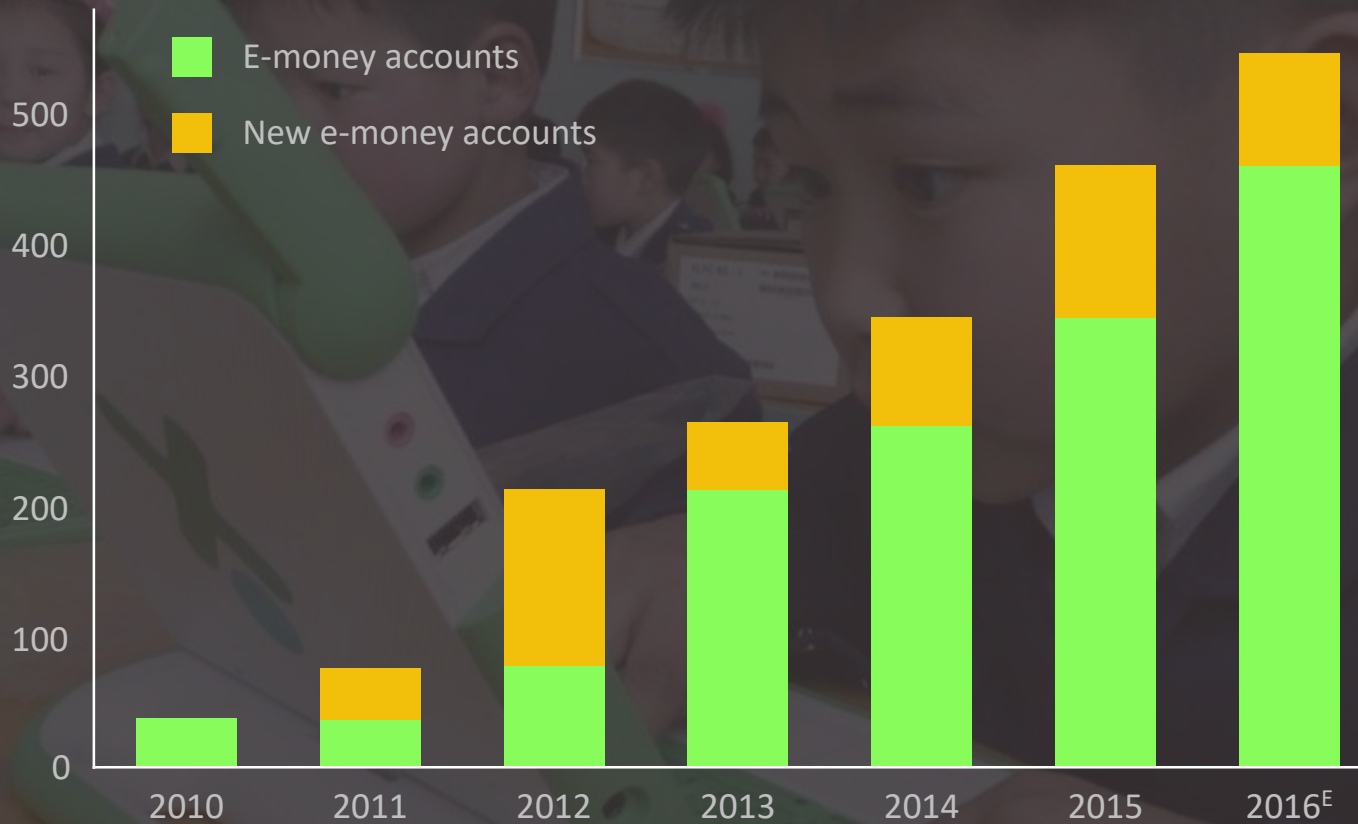


Source: World Bank Group Global Payment Systems Survey

Yet improvements in global societal wellbeing are apparent in increased rates of access to basic needs and opportunities

E-money accounts are further enabling access

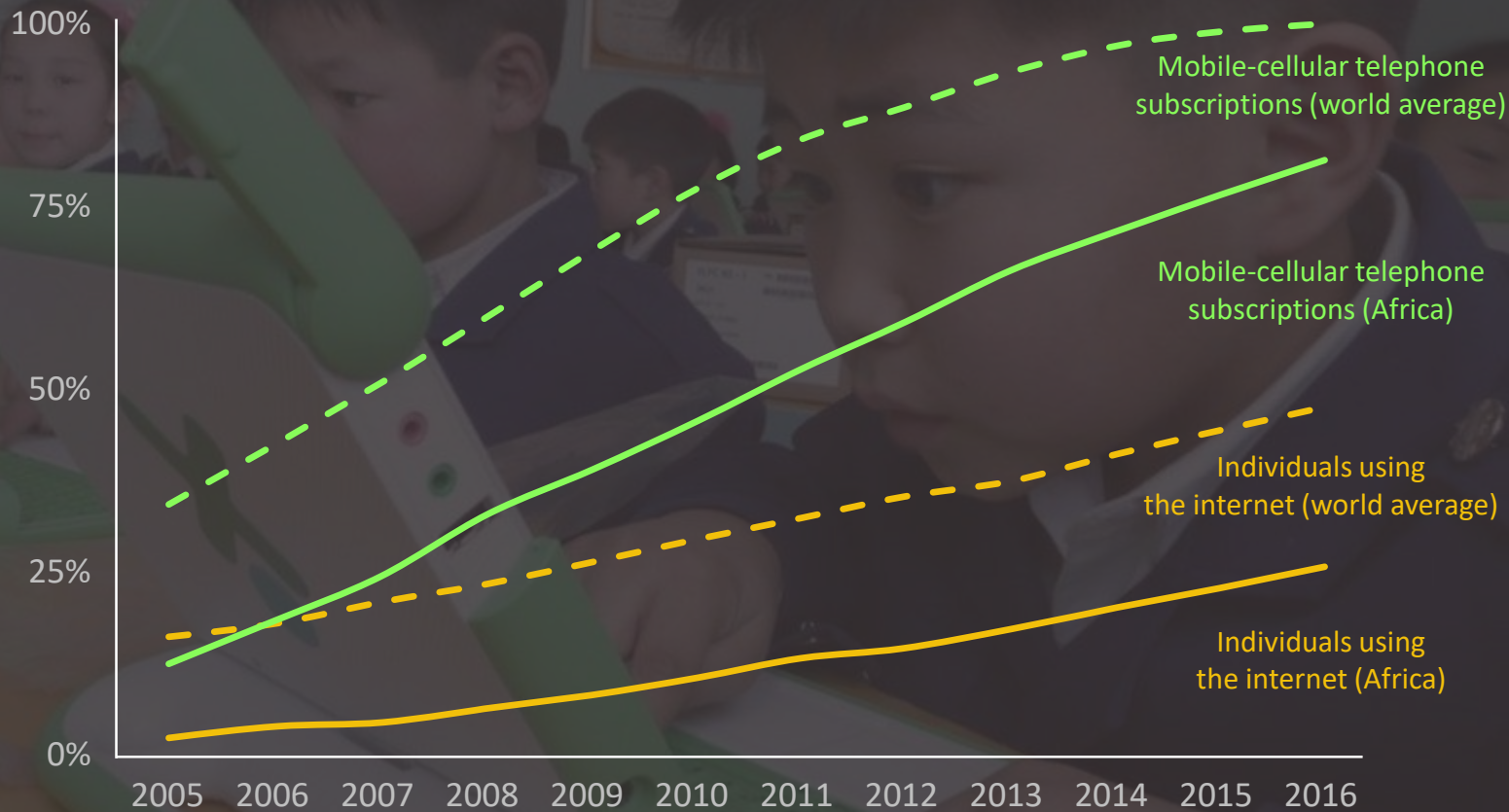
New e-money accounts created in UFA focus countries (m)



Yet improvements in global societal wellbeing are apparent in increased rates of access to basic needs and opportunities

Much of this progress is made possible by tools leveraging growing internet penetration in developing markets

Trends in mobile-cellular telephone subscriptions and individual internet usage



Wellbeing trends to monitor:



Social cohesion, the reconstruction of social capital across all levels of society, and the role of technology therein



Erosion of stigma and misconceptions attached to mental health



The genomics market and implications around healthcare provision and access



Equality of opportunity and of wellbeing trends across different demographic groups



...among others

A sustainable economy includes increased innovation in:

Mobility



Energy



Built Environment



Food Systems



Wellbeing



Image sources



Proterra electric bus
www.insideevs.com/proterra-catalyst-xr-bus-gets-new-330-kwh-battery-pack

8



Citymapper's transit app
www.macrumors.com/2015/03/27/citymapper-and-transit-app

20



Volvo's autonomous car design
www.futurism.com/volvo-unveils-autonomous-car-design-set-to-hit-the-roads-by-2017

25



Viaduct-embedded wind turbine concept
www.popsoci.com/technology/article/2011-02/wind-turbines-embedded-italian-viaduct-would-preserve-architecture-and-generate-power

37



Tesla's solar roof
www.cadintentions.com/cool-tech-tesla-solar-roof-tiles-are-available-to-order

41



M-Kopa's solar system
www.m-kopa.com/category/updates

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Carbon Pricing Leadership Coalition, World Bank
www.blogs.worldbank.org/climatechange/reaffirming-our-commitment-carbon-pricing-and-climate-action

60



Kingspan's "Passive House"
www.kingspaninsulation.co.uk/Knowledge-Base/Passivhaus.aspx

70



Desktop Metal's Studio System 3D printer
www.computerworld.com/article/3192127/computer-hardware/startup-claims-3d-printers-create-metal-parts-faster-more-cheaply.html

82



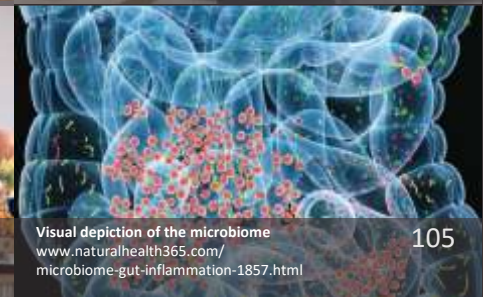
Impossible Burger as advertised at Momofuku
www.ny.eater.com/2016/9/2/12691348/nyc-david-chang-impossible-burger-review

93



Grocery store free-from aisle
www.dairyfreebabyandme.blogspot.co.uk/2015/01/shopping-with-food-allergies-in-uk.html

97



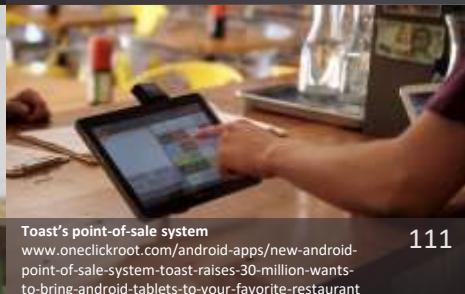
Visual depiction of the microbiome
www.naturalhealth365.com/microbiome-gut-inflammation-1857.html

105



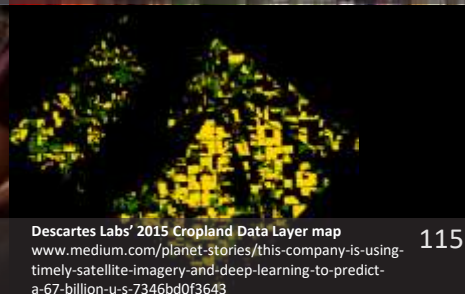
Sun Basket's 100% recyclable meal kit box
www.sunbasket.com

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Toast's point-of-sale system
www.oneclickroot.com/android-apps/new-android-point-of-sale-system-toast-raises-30-million-wants-to-bring-android-tablets-to-your-favorite-restaurant

111



Descartes Labs' 2015 Cropland Data Layer map
www.medium.com/planet-stories/this-company-is-using-timely-satellite-imagery-and-deep-learning-to-predict-a-67-billion-u-s-7346bd0f3643

115



OLPC XO \$100 laptop in use in Ulaanbaatar
www.techenet.com/2014/01/gadgets-de-technologie-para-o-aprendizado-do-seu-filho

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generation__