

Utility Investments in Distributed Energy

Trends Among North American and European Utilities

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Utility Investments in DERs

ID	Type	Name	Location	Size	Energy	Company	Investment Type	Investment Size	Investment Start	Investment End	Investment Status
1	Direct Customer Energy Management	1/2018/18	US	100,000,000	100,000,000	100,000,000	100,000,000	100,000,000	100,000,000	100,000,000	100,000,000
2	Direct Customer Energy Management	2/2018/18	US	200,000,000	200,000,000	200,000,000	200,000,000	200,000,000	200,000,000	200,000,000	200,000,000
3	Direct Customer Energy Management	3/2018/18	US	300,000,000	300,000,000	300,000,000	300,000,000	300,000,000	300,000,000	300,000,000	300,000,000
4	Direct Customer Energy Management	4/2018/18	US	400,000,000	400,000,000	400,000,000	400,000,000	400,000,000	400,000,000	400,000,000	400,000,000
5	Direct Customer Energy Management	5/2018/18	US	500,000,000	500,000,000	500,000,000	500,000,000	500,000,000	500,000,000	500,000,000	500,000,000
6	Direct Customer Energy Management	6/2018/18	US	600,000,000	600,000,000	600,000,000	600,000,000	600,000,000	600,000,000	600,000,000	600,000,000
7	Direct Customer Energy Management	7/2018/18	US	700,000,000	700,000,000	700,000,000	700,000,000	700,000,000	700,000,000	700,000,000	700,000,000
8	Direct Customer Energy Management	8/2018/18	US	800,000,000	800,000,000	800,000,000	800,000,000	800,000,000	800,000,000	800,000,000	800,000,000
9	Direct Customer Energy Management	9/2018/18	US	900,000,000	900,000,000	900,000,000	900,000,000	900,000,000	900,000,000	900,000,000	900,000,000
10	Direct Customer Energy Management	10/2018/18	US	1,000,000,000	1,000,000,000	1,000,000,000	1,000,000,000	1,000,000,000	1,000,000,000	1,000,000,000	1,000,000,000

DER types included in the database:

- Combined Heat and Power
- Direct Customer Energy Management
- Energy Storage
- Electric Vehicle Infrastructure
- Fuel Cells
- Solar
- Utility Customer Energy Management
- Utility DER Integration

Introduction






















The emergence of distributed energy resources (DERs) is often characterized as occurring despite, or even in opposition to, traditional utility companies. While this may have been true in the early days of the DER market, times have changed. Many utilities are putting time, energy and capital behind companies and technologies that directly or indirectly enable customers to save, modify, generate and store their own electricity in new ways.

In order to analyze this trend, GTM Research constructed a database of all utility equity investments in distributed energy companies since 2010. The overarching conclusion is clear: Utilities are increasingly investing in a distributed energy future. However, the level of commitment and strategy varies widely across utilities and regions.

Methodological notes:

- We use an inclusive definition of “utilities” which includes both regulated utilities and competitive retailers. When referring to a utility’s location, we focus on the location of its corporate headquarters.
- We include minority equity investments (both direct and via independent funds) as well as acquisitions. We do not include project/portfolio investments in DER assets.
- We focus on North America and Europe, where the vast majority of active utility investments have taken place.
- While we have made every effort to include all utility investments, we cannot guarantee comprehensiveness. To inquire about data or to add additional investments, contact gridsubscription@gtmresearch.com.
- In some cases, investment totals (\$) may refer to total funding round size, not an individual utility’s contribution to that fund.

Market Segments Covered

Market Segment Definitions	Example Companies		
Direct Customer Energy Management – Technologies and services sold directly to customers in order to modify load, save energy and/or participate in demand response			
Utility Customer Energy Management – Technologies and services sold to utilities to help them with customer energy management programs, load modification and customer engagement			
Distributed Solar – Rooftop and behind-the-meter solar technologies, installers and service providers			
Distributed Energy Storage – Distributed energy storage technologies, installers and service providers			
Utility DER Integration – Grid hardware, software and services that provide visibility into and/or management of distributed energy resources			
Combined Heat and Power – Technologies and services related to the production of useful heat in conjunction with electric power, including waste heat recovery and conversion to electricity			
Other – Electric vehicle infrastructure, fuel cells, etc.			

Key Findings

- Utility companies in North America and Europe have invested over **\$2.9 billion** in **130 individual distributed energy companies** since 2010
- Investment volumes have increased substantially over the past two years, and over **\$1 billion** of the total came in 2016 alone
- **42 utilities** have made investments or acquisitions in this market, and 10 of these companies have made at least five investments
- Five of the seven most active utility investors are headquartered in Europe, but a larger number of North American utilities have made at least one investment
- North American utilities have focused more on **distributed solar**, while European utilities have invested more in **combined heat and power**
- Most investments have resulted in minority equity stakes, but **37 distributed energy companies have been acquired by utility companies**

Top Ten Utility Investors in Distributed Energy Companies

Rank	Utility Holding Company	HQ	HQ Region	No. of Portfolio Companies
1	Engie	France	Europe	15
1	E.ON	Germany	Europe	14
3	Exelon	USA	North America	13
4	RWE	Germany	Europe	12
5	Centrica	United Kingdom	Europe	9
5	EDF	France	Europe	9
5	NRG	USA	North America	9
8	Edison International	USA	North America	8
9	Great Plains Energy	USA	North America	7
10	Vattenfall	Sweden	Europe	5
10	Southern Company	USA	North America	5
10	Duke Energy	USA	North America	5

TOP FIVE UTILITY DISTRIBUTED ENERGY INVESTMENT PORTFOLIOS



SOLAR	
Astrum Solar	PosiGen
ENERGY STORAGE	
Aquion Energy	Stem
Qnovio	
OTHER DISTRIBUTED ENERGY RESOURCES	
ChargePoint	V-Grid
DIRECT CUSTOMER ENERGY MANAGEMENT	
CPower	Esses
eCurv	Powerhouse Dynamics
UTILITY CUSTOMER ENERGY MANAGEMENT	
Bidgely	
UTILITY DER INTEGRATION	
Consert	



SOLAR	
Astrum Solar	
OTHER DISTRIBUTED ENERGY RESOURCES	
ENER-G Cogen	
DIRECT CUSTOMER ENERGY MANAGEMENT	
4energy	Econergy
AlertMe	MyJoulo
Clockwork Home Services	Panoramic Power
UTILITY DER INTEGRATION	
Power Plus Communications	



SOLAR	
Sungevity	
ENERGY STORAGE	
Greensmith	
OTHER DISTRIBUTED ENERGY RESOURCES	
Better Place	Heat & Power
Bloom Energy	Orcan
Noginsky Teplovoy Center	
DIRECT CUSTOMER ENERGY MANAGEMENT	
Greenwave Systems	Organic Response
UTILITY CUSTOMER ENERGY MANAGEMENT	
Bidgely	FirstFuel
Enverree	
UTILITY DER INTEGRATION	
AutoGrid	SpaceTime Insight



SOLAR	
BBOX	kWh Analytics
Enlight	OneRoof Energy
ENERGY STORAGE	
Advanced Microgrid Solutions	Green Charge
OTHER DISTRIBUTED ENERGY RESOURCES	
Powerdale	
DIRECT CUSTOMER ENERGY MANAGEMENT	
C3 Resources	KiWi Power
Ecova	OpTerra
UTILITY CUSTOMER ENERGY MANAGEMENT	
Tendril	Retroficiency
UTILITY DER INTEGRATION	
Opus One	Sigfox



SOLAR	
Belectric	Heliatek
Conergy	
ENERGY STORAGE	
Sonnen	Stem
OTHER DISTRIBUTED ENERGY RESOURCES	
AIREC	Oxygen Initiative
DIRECT CUSTOMER ENERGY MANAGEMENT	
RUMM	
UTILITY CUSTOMER ENERGY MANAGEMENT	
Bidgely	BigchainDB
UTILITY DER INTEGRATION	
Enercast	Kiwigrind

Top Utility Investors: North America

Rank (by # of investments)	Utility Holding Company	HQ	Owner of a Regulated Subsidiary?	Primary Investment Arm (if relevant)	Number of Portfolio Companies	Number of Direct Investments	Known Amount Invested (\$M)
1	Exelon	USA	Yes	Constellation Technology Ventures	13	13	\$257
2	NRG	USA	No	-	9	9	\$114
3	Edison International	USA	Yes	Edison Energy Group	8	8	\$60
4	Great Plains Energy	USA	Yes	GXP Investments, Energy Impact Partners	7	4	\$49
5	Southern Company	USA	Yes	Energy Impact Partners	5	1	\$472
5	Duke Energy	USA	Yes	-	5	5	\$127
7	Xcel Energy	USA	Yes	Energy Impact Partners	4	0	\$41
8	Ameren	USA	Yes	Energy Impact Partners	3	0	\$21
9	NextEra Energy	USA	Yes	ClearSky Power & Technology Fund	2	2	\$37
9	Sempra Energy	USA	Yes	-	2	2	\$75
9	AEP	USA	Yes	-	2	2	\$33
9	Fortis	Canada	Yes	Energy Impact Partners	2	0	\$7
9	Avista	USA	Yes	Energy Impact Partners	2	1	\$15

Notes: Direct investments are those made through an in-house entity, as opposed to those made through an independently run investment firm; number of investments excludes follow-on investments; amount invested (\$) may reflect total size of funding rounds rather than the individual utility's contribution to the rounds

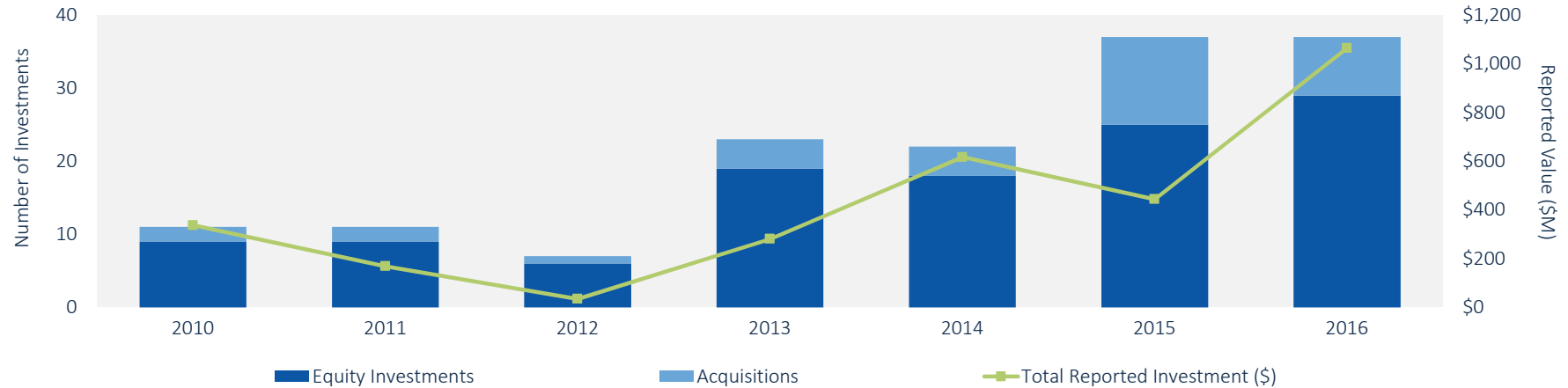
Top Utility Investors: Europe

Rank (by # of investments)	Utility Holding Company	HQ	Owner of a Regulated Subsidiary?	Primary Investment Arm (if relevant)	Number of Portfolio Companies	Number of Direct Investments	Known Amount Invested (\$M)
1	Engie	France	No	Engie New Ventures	15	15	\$491
1	E.ON	Germany	Yes	-	14	14	\$344
3	RWE	Germany	Yes	Innogy Ventures	12	7	\$206
4	Centrica	United Kingdom	No	-	9	9	\$632
4	EDF	France	Yes	Electranova Capital	9	3	\$52
6	National Grid	United Kingdom	Yes	Energy Impact Partners	5	1	\$53
6	Vattenfall	Sweden	Yes	Yellow&Blue	5	1	\$4
8	Statkraft	Norway	Yes	Statkraft Ventures	3	3	\$25
8	SSE	United Kingdom	Yes	SSE Ventures	3	3	\$26
8	ČEZ	Czech Republic	Yes	Inven Capital	3	3	\$118

Notes: Direct investments are those made through an in-house entity, as opposed to those made through an independently run investment firm; number of investments excludes follow-on investments; amount invested (\$) may reflect total size of funding rounds rather than the individual utility's contribution to the rounds

Annual Investments Have Nearly Tripled in Number and Value Since 2010

Utility Investments in Distributed Energy Companies, 2010-2016



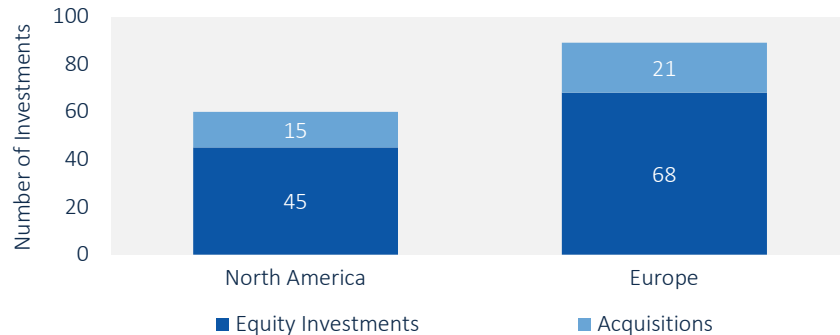
- Utilities have invested over \$2.9 billion in distributed energy companies since 2010. The actual number is undoubtedly significantly higher because investment amounts and acquisition prices are sometimes kept private. Over \$1 billion of this total was invested in 2016 alone.
- Investment volumes increased substantially in 2015 and 2016, reflecting growing interest from utilities and their affiliates in distributed energy.

Note: Excludes follow-on rounds and treats single rounds with multiple utility investors as one investment

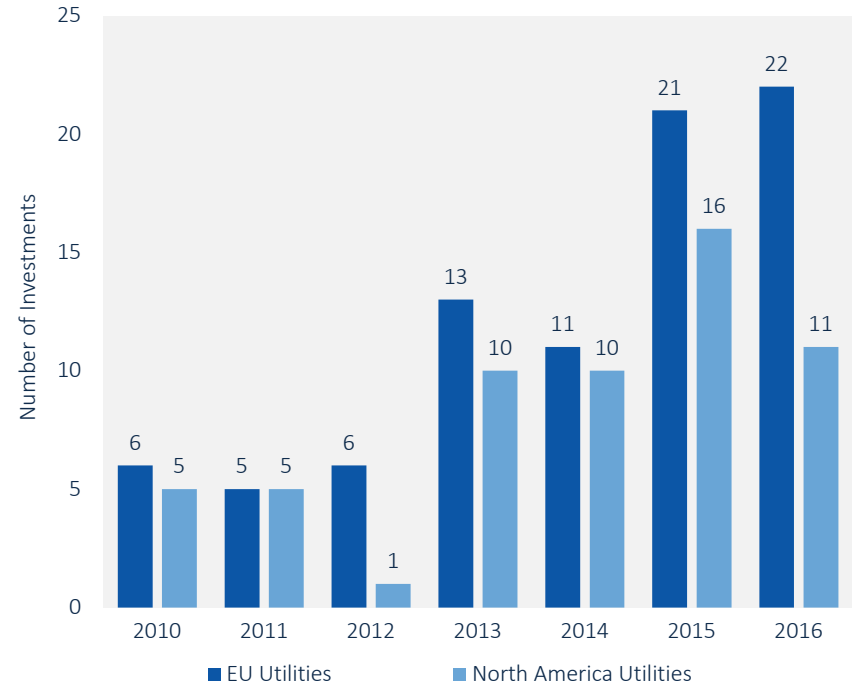
European Utilities Have Been More Active Than Their North American Counterparts

- European utilities have invested at least \$1.78 billion in distributed energy companies as compared to \$1.1 billion from their North American counterparts.
- European utility investments have been particularly aggressive over the past two years, as the traditional utility business model has been under threat throughout the region.

Cumulative Distributed Energy Investments To Date, NA vs. EU Utilities

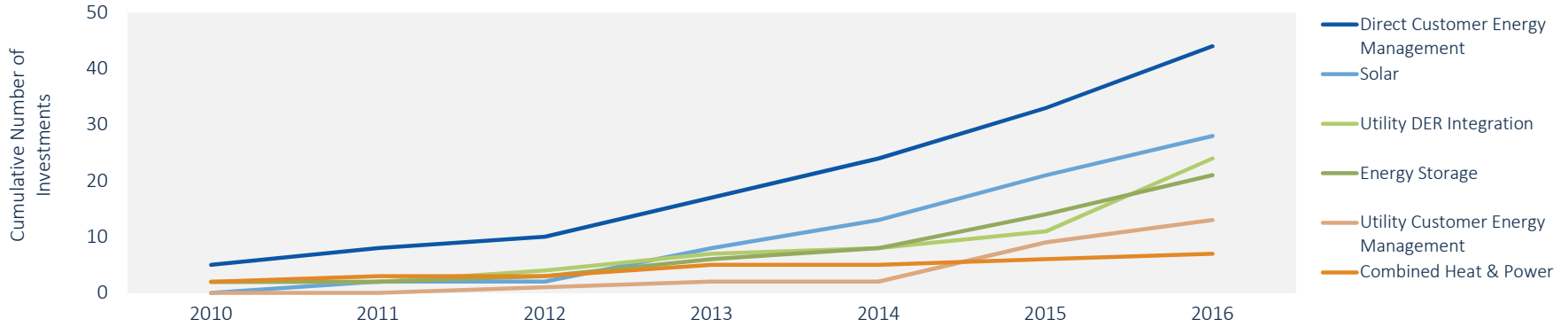


Investments in Distributed Energy Companies by Utility Region, 2010-2016



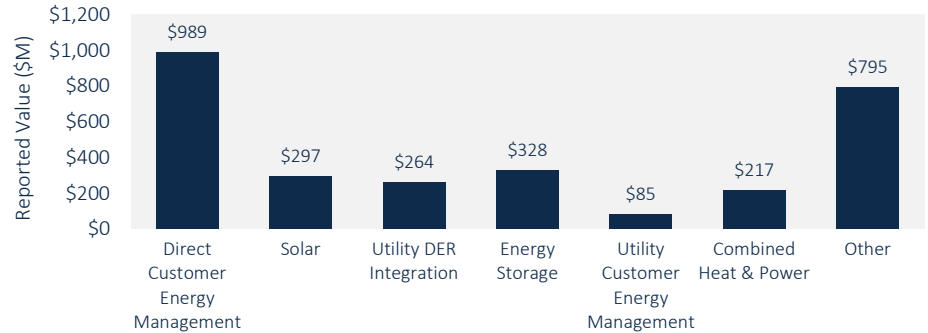
Direct Customer Energy Management, Solar and DER Integration Receive Most Investments

Cumulative Utility Investments in Distributed Energy Companies, 2010-2016



- In both number of investments and dollar terms, direct customer energy management companies have received the most investment from utilities seeking to offer new solutions to their customers.
- Solar investment has picked up since 2013, while utility DER integration became a major focus in 2016.

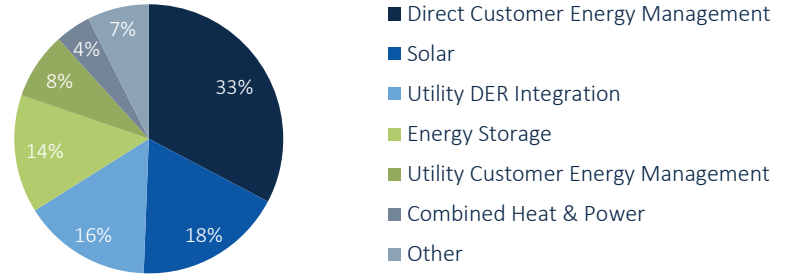
Note: "Other" category contains \$431M acquisition of fuel-based DG provider PowerSecure by Southern Company



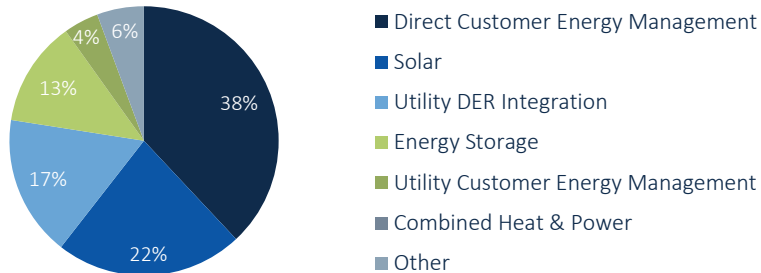
European Utilities Have Been More Active Overall, But U.S. Utilities Are More Invested in Solar

- North American utilities have focused on direct customer energy management solutions, while European utilities have invested more in utility customer energy management.
- Solar has been a greater focus of investment in North America, whereas combined heat and power has taken a larger share in Europe.

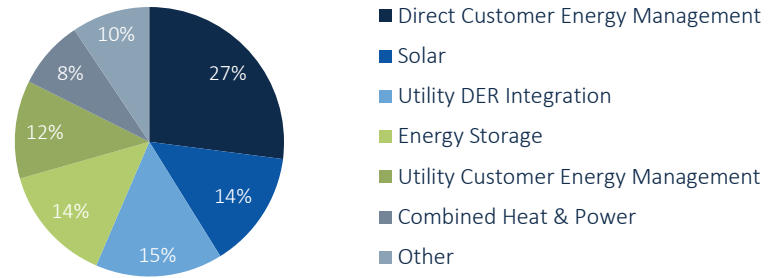
Total Number of Utility Investments in Distributed Energy



North America: Number of Utility Investments in Distributed Energy



Europe: Number of Utility Investments in Distributed Energy



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