# **Utility Investments in Distributed Energy**

Trends Among North American and European Utilities

**Shayle Kann** 

Head of GTM Research

**Andrew Mulherkar** 

Senior Analyst, GTM Research



GTM Research is the leading market analysis and advisory firm on the transformation of the global electricity industry.



Solar Power





Grid Edge



**Energy Storage** 



In-Depth Market Reports



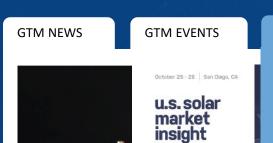
Data and Forecasts



Analyst Access

Learn more at www.gtmresearch.com

All our subscriptions include:



2016

gtmresearch.com



# Get the data behind the analysis

The full database of utility investments is available to members of the Grid Edge Executive Council.

The Grid Edge Executive Council represents an exclusive group of decision makers driving the future of the electric grid.

Membership includes: in-depth market reports, analyst access, data services, and invitations to executive meetings.

### Utility Investments in DERs

		- 4					- 0		- 381	
atmrece	arch									
gtmrese	grerr									
50.0	- Company of the Comp			Matter		Approximation of the second	- construction	· · · · · · · · · · · · · · · · · · ·	Hat Page Marie	
OR Sec	See Species from Artistry				1 termina (	Altiting Enabling Company				
Direct Decision Strongs Management	\$/04/08/0 GE 2013 2813 Investment		\$16,300,000		Bridde Co.	Derik Sul	Arched Organie	Darger	What	
David Dolance Beerge Management	S/M/2002 (GEDITE BYTE Investment)		22.00		Electricismon Coultail	4E+	France	Racope	110.0	
puedhousette	5/36/363 G2 3015 2015 (viestnern		94,000,000		1506	1004	1900	10094	MON	
tice:	Middles Grigory 2011 investment		\$1,640,300		tenogy vertured	PHI	servey	Datase	100	
Carrie Distriction Princips Management	80/3/2009 Gt 2019 2010 (newfram)		SHOUGHO.		Sanitale Case	Serbito.	Service Gegenne	Twist	Net	
Direct Declarate Pronge Management	\$/15/2008 G1 2019 2019 August time	75.05	967,000.000		Bridd files	Deskilar	Jeried Regions	Taraps	MARK	
declar .	20/20/2023 G1 2015 2015 ADMINISTRA				REGISTRATION I	Misonistensional	201.	30/37/16/07	197.7	
Elven same	SS/S/SS/R GR 2014 2014 Investment		\$2,762,040		teur	DIA.	pytownero	Larges	1997	
Congressment	105/2019 GE 2014 2014 Institution		\$9,9600		December of the second section in	Inter	NA.	Anch a mores.	700	
3 Grief	A/07/06L1 (02:3011-2011 shreshmen)		61,000,000		Servicification Technology its stones	Duelov	SEA	Sirects & reporters	TREE	
2 Notes	11/4/80X G1 2013 2013 (see Aven)	2138	83,509,770		Smithton Intractor to due:	Bullion	JM.	Surfe disease.	16.8	
# DOM	YORKSON GO SIN 4 STAN Appearance		\$94,000,000		2red bregs	DESCRIP	African Gargoost	twope	Mass	
5 LM IN CURRONNESSON	s/sylaps Gt 30n4 2614 investment	Tor.	\$14,06000 \$34,00000		100	EON:	Service	Large	TRACE	
Ellerits CCS anagresion	\$34364 G23015 S95 ruestnam	100							PACE	
7 Littling CRS acregorians	ANALYSIS CONTRIBUTION IN CONTRIBUTION		ER/09/000	THE	Frequency (Second Sec.)	National State	Serior Degree	Faculty		
E (All Ib) CER bit age (Ib)	104003 GZDCS STOTIONSON		\$38,000,000	THE	Energy teped Fortiers (Discor)	Dear	MM.	borth/resta	THUE	
S (Otros paramagnas): E) in in ( ) i imagnas):	S/M/SS 02 3015 2815 Newtonic S/M/SS 02 3015 2815 Newtonic		\$8,000.00	1980		Southern Compility	386	NO/OXA NATION	1866	
			\$8,000,00	- P05	I nextly religion remners (total charge).	Hosel Charges	SA Samo	April America	PAIN	
Const.	8/9/3908 GN3016-2015 (ventroes: 1/5/2017 G1 2017 7817 Applifter		5808000			English .	Serminy	Target Target	TRACE	
					tong II	E.ON			THE	
Distribution	SUNTERS CORPORATION CONTRACTOR		SAME OF		Long and Arrive technology sent and	EURCO :	demay.	Barops North & Service	100	
5 OR IN CURDING CHARL WAS ARREST	11/4/2015 Ge 2015 2015 myestner		\$8,00,00	THE	TOA	E.06	Services Co.	Europe Europe	TRAC	
S (All this Common from Monagement	10/4/2015 G# 2015 2015 (numbers)		\$14,600,000	1547	to f	E.OH	Serency.	Large	DAZ	
C. M. By Container Breegy Hampirose:	6/5/2015 GEROLE SELECTORISMS		DATE: OCC	1000	NAT .	DVE.	Geney	Darwar	79.0	
S had be to	1/3/201 CCS/11/217/ (vehicle)		\$180,000 000		155	AUN:	Service	Sarage Sarage	790.0	
2 (DRACT OLEDINAT STATE MATADEMAN	2/W/017 Of 3017 2017 (Newton)		\$28,000,000		ON THE PARTY.	South Management	204	SOFT ATMENTS	THE	
# (Dept. Cultimer Dengs Management	MAYOR OF 2015 Appointm		3		Code:	Triple	Den	Twose .	FALM	
TV inhearing	EXCUSES CORES TRUSCOPPING		\$71,000.000		Department for contagging an extract	Toring	464	Similar medical	nur	
2 IV Musicalus	SWINS GURANT Minimaken	75/6	\$10,000,000		Sandrillarian Trainmong Perdent	Batho	200	Turk free to	TRX	
0 9090	Allegar G2 3013 2012 (yearner)		\$2,000,000		Districtly	DARRING	95	NOTE A WIND	180.5	
d Solar	4W000 102 3017 2513 Investment		\$10,000,000	Free.		Otion Manageral	and.	- NOTE A TRATE	10.5	
R Griss	4/97/01 02:20/3:2015 rougeur		SOMEON	THE		Security County	200	Service American	Ch-C	
B Part Or b	1/95/2001. ICT 2017 2011 Investment		\$1,000,000	-	Southern California Eur Company	Secreta fronty	ANA.	Similar describer	TRE	
* Notice is	\$75/201 G02011 2811 (vestion)	2436	\$15.00.00		Explained Editor to East Complaine	Section Strongs	ant.	North Coming	7804	
B Descriptioner breign Management	6/38/2029 1G2 2018 2010 Appendix		1281.000.000		2010/16/10	Dentity .	An teld rendcoler	Larges .	PALSE	
d note	Valors of 805 805 negative				HAVE THE THE THE THE THE THE THE THE THE TH	F96.	Sentary.	Larren	10.5	
El Okser Ontoner Dange Management	409/08/9 IG2 2018 2010 Investment		STREMAST.		Denote Berlin Terrinology in stores	Durley	464	North America.	796.0	
Burgelong	DATASONS CLISICS STREET, CANADISS.				200 seed seek	Bred Barr Bridge	and .	North Resident	THE	
	W/S/2000 ST 2018 2010 Assessment		278,000,000		Series Committees	total	494	NOTE CHANGE	795.5	
O NATION CONTRACTORS	aftalone Or Dies 2000 symptoms		SECHORY		Nation Eather	NAMES OF THE OWNER,	Division -	Limboo	1954	
are.	6074/2603 G4 2013 2015 Ampointed		1		109	CON	Sentence	Large	Dati	
A David Subsect Dungs Management	DATE ON A CANCER PARTY Ampointment				Education and tens	Edward strangement	au.	South America	7947	
B. North Total	ESTABLE OF SOLF SETT Assessmen				Fred General Power South Streeting	Faci	140	Turnet.	THAT	
Utility DOT STARLESON	elselses, colone stro resident.		33.000.000		Editor: Peoples	Decort.	Survey	Sales	7900	
Scot	Values G1 2015 2015 investment		I Services		come	1000	dentary -	Laborate	1163	
8 Disent Outomar Dearge Management	659/3902 G5 2012 2912 Humaham		\$1,900,000		and Change	pur lowery	Cartalia	Sort anems	YARE	
Eliferen Destauer Berrigs Management	9/14/2015 GL 2015 2015 Inventorer		\$16,000,000		510	560	JAN.	Stort & A her but	PALM	
David Dullance Beerge Management	SANSONS GROUT SETT Aspection.		\$4,900,000		Selan Sui	Serialisa	Striked Gryslem	Target	MARK	
Depth buttons seems Management	APASSE (QD 0014 2814) Appeals on		\$80,000,000		riget	MARI	+19000	harries.	PALES	
Ower Duromer Deeps Merapament	\$25000 Q2 2014 2014 (Newton)		\$1,900,000		Landa Retrieval Service Copy (No. 10), (No. 1)	Distor	254	Some america	(9).0	
All miles CES prognotion	\$79,065 IGL 2015 2015 Investment		\$71,000,000		Informational Information (I	District International	464	America di marcino	THE	
A LATTIC DAS broggarion	209/067 G1 2017 2017 (newhreen)		E0.000.000		Salternal Sald	Solombins .	derive they on	Target	THE	
& Direct Deal arrow heaving Management	3/9/001 G1 9014 2011 (viewlene)		\$1,000,000		Direling	Date Brough	JMA.	Nathdreens	7900	
Master Data Se						1				

#### 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			
<b>Direct Customer Energy Management</b> – Technologies and services sold directly to customers in order to modify load, save energy and/or participate in demand response	alertme	ENT@UCH CONTROLS	<b>Sense</b> Labs <sup>88</sup>	
<b>Utility Customer Energy Management</b> – Technologies and services sold to utilities to help them with customer energy management programs, load modification and customer engagement	bidgely	ENERGYSAVVY	FIRSTFUEL	
<b>Distributed Solar</b> – Rooftop and behind-the-meter solar technologies, installers and service providers	ASTRUM <b>SOLAR</b>	REC	S OLS Y S T E M S	
Distributed Energy Storage – Distributed energy storage technologies, installers and service providers	sonnen	stem	SUNVERGE	
<b>Utility DER Integration</b> – Grid hardware, software and services that provide visibility into and/or management of distributed energy resources	<b>∜</b> AutoGrid	<b>⊘</b> enbala	• opusone	
<b>Combined Heat and Power</b> – Technologies and services related to the production of useful heat in conjunction with electric power, including waste heat recovery and conversion to electricity	ENER-G	<b>₩</b> Heat&Power	orcan to Hillero Company	
Other – Electric vehicle infrastructure, fuel cells, etc.	Bloomenergy	-chargepoin+.	oxygen	

# **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

# centrica



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



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 Enervee

UTILITY DER INTEGRATION

AutoGrid SpaceTime Insight

**engie** 

RWE

SOLAR Astrum Solar

PosiGen

**ENERGY STORAGE** 

= Exelon.

Aguion Energy Onovo

Stem

OTHER DISTRIBUTED ENERGY RESOURCES

ChargePoint

V-Grid

DIRECT CUSTOMER ENERGY MANAGEMENT

**CPower** 

Essess

eCurv

Powerhouse Dynamics

UTILITY CUSTOMER ENERGY MANAGEMENT

Bidgely

UTILITY DER INTEGRATION

Consert

DIRECT CUSTOMER ENERGY MANAGEMENT C3 Resources KiWi Power

OTHER DISTRIBUTED ENERGY RESOURCES

Ecova

Powerdale

OpTerra

kWh Analytics

Green Charge

OneRoof Energy

UTILITY CUSTOMER ENERGY MANAGEMENT

Tendril

SOL AR

BBOXX

Enlight

**ENERGY STORAGE** 

Advanced Microgrid Solutions

Retroficiency

UTILITY DER INTEGRATION

Opus One

Sigfox

SOI AR Conergy

Belectric Heliatek

**ENERGY STORAGE** 

Sonnen Stem

OTHER DISTRIBUTED ENERGY RESOURCES

AIREC

DIRECT CUSTOMER ENERGY MANAGEMENT

Oxygen Initiative

RUMM

UTILITY CUSTOMER ENERGY MANAGEMENT

Bidgely BigchainDB

UTILITY DER INTEGRATION

Enercast Kiwigrid



# 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



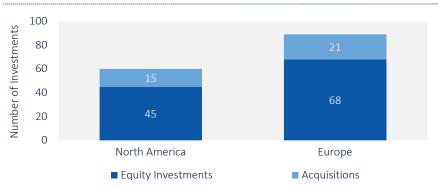
- Utilities have invested over \$2.9 billion in distributed energy companies since 2010. The actual number is undoubtedly significantly higher because investment amounts and acquisition prices are sometimes kept private. Over \$1 billion of this total was invested in 2016 alone.
- Investment volumes 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

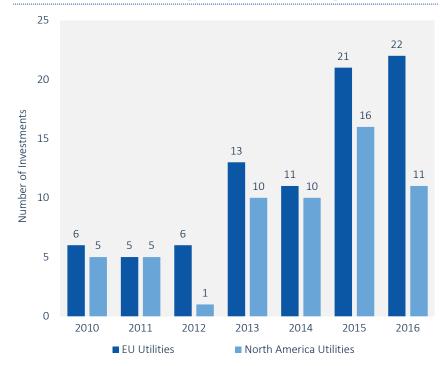
# European Utilities Have Been More Active Than Their North American Counterparts

- 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

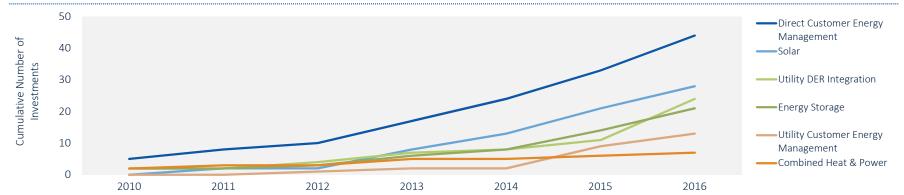


#### Investments in Distributed Energy Companies by Utility Region, 2010-2016



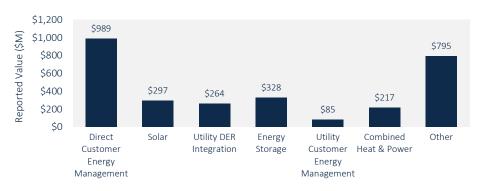
# Direct Customer Energy Management, Solar and DER Integration Receive Most Investments

#### 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.

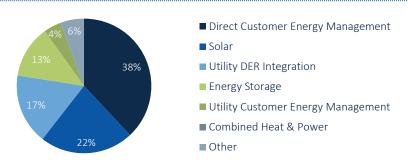
Note: "Other" category contains \$431M acquisition of fuel-based DG provider PowerSecure by Southern Company



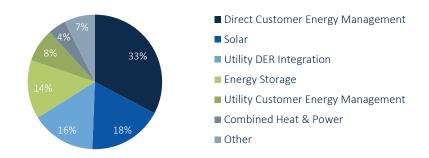
## European Utilities Have Been More Active Overall, But U.S. Utilities Are More Invested in Solar

- 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.

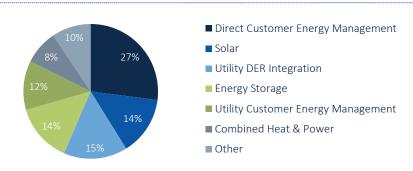
#### North America: Number of Utility Investments in Distributed Energy



### Total Number of Utility Investments in Distributed Energy



#### Europe: Number of Utility Investments in Distributed Energy



# **Utility Investments in Distributed Energy**

Trends Among North American and European Utilities

**Shayle Kann** 

Head of GTM Research

**Andrew Mulherkar** 

Senior Analyst, GTM Research

