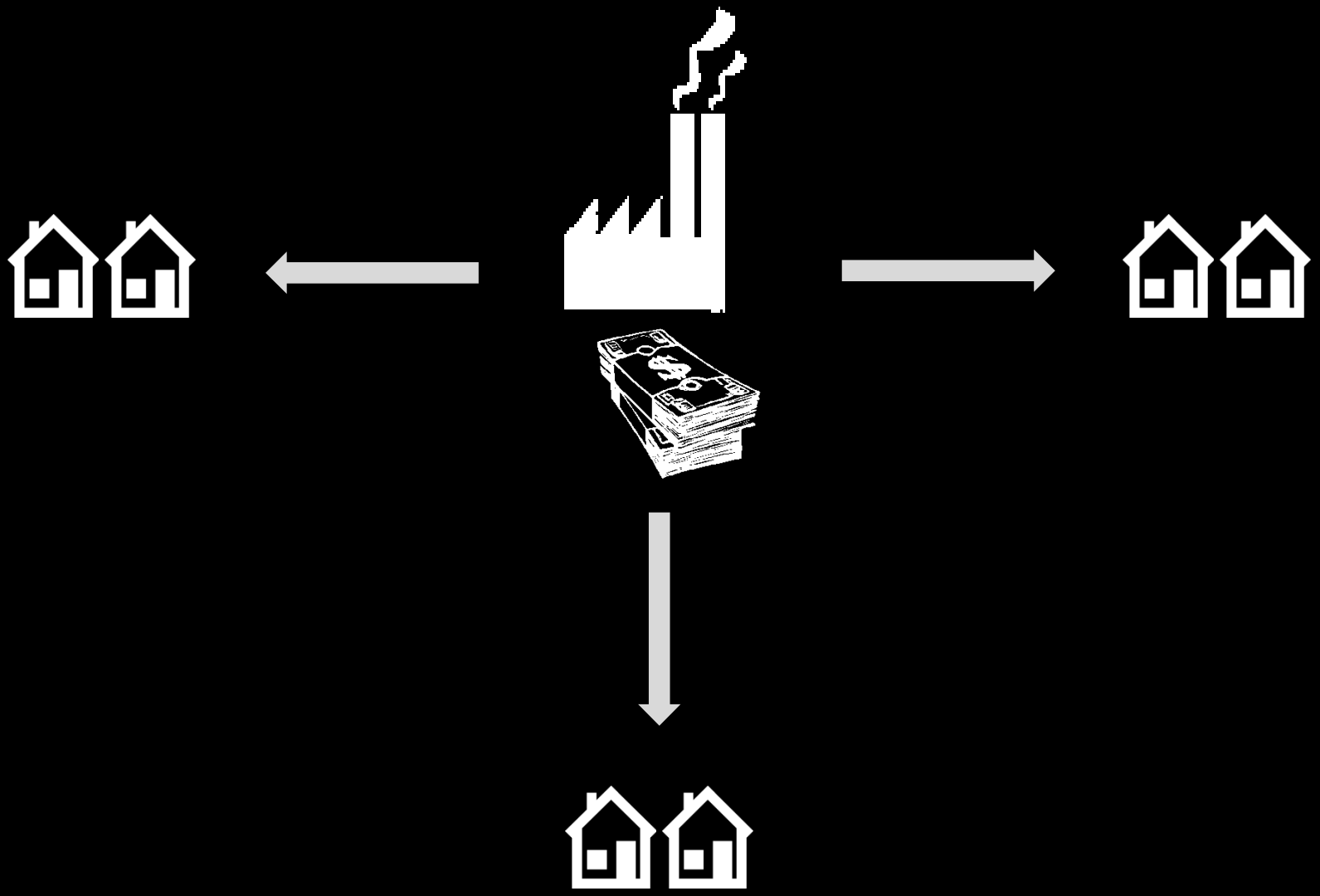
Cheap renewables

Dawn of a new energy era

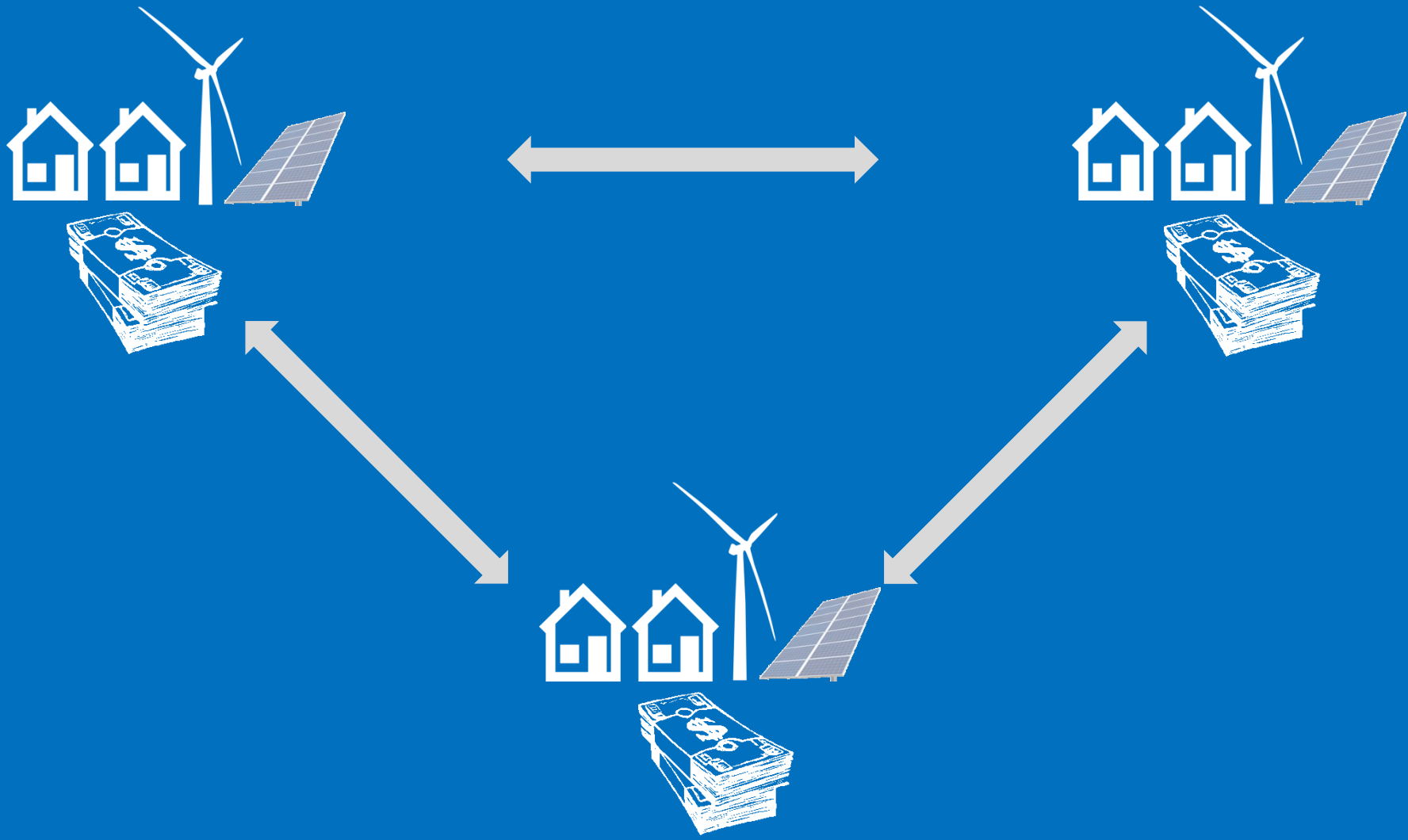
By Bart Linssen

Renewable energy in Taiwan

From Centralized Energy

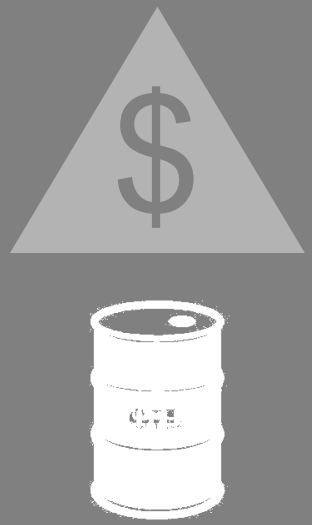


To Power to the people



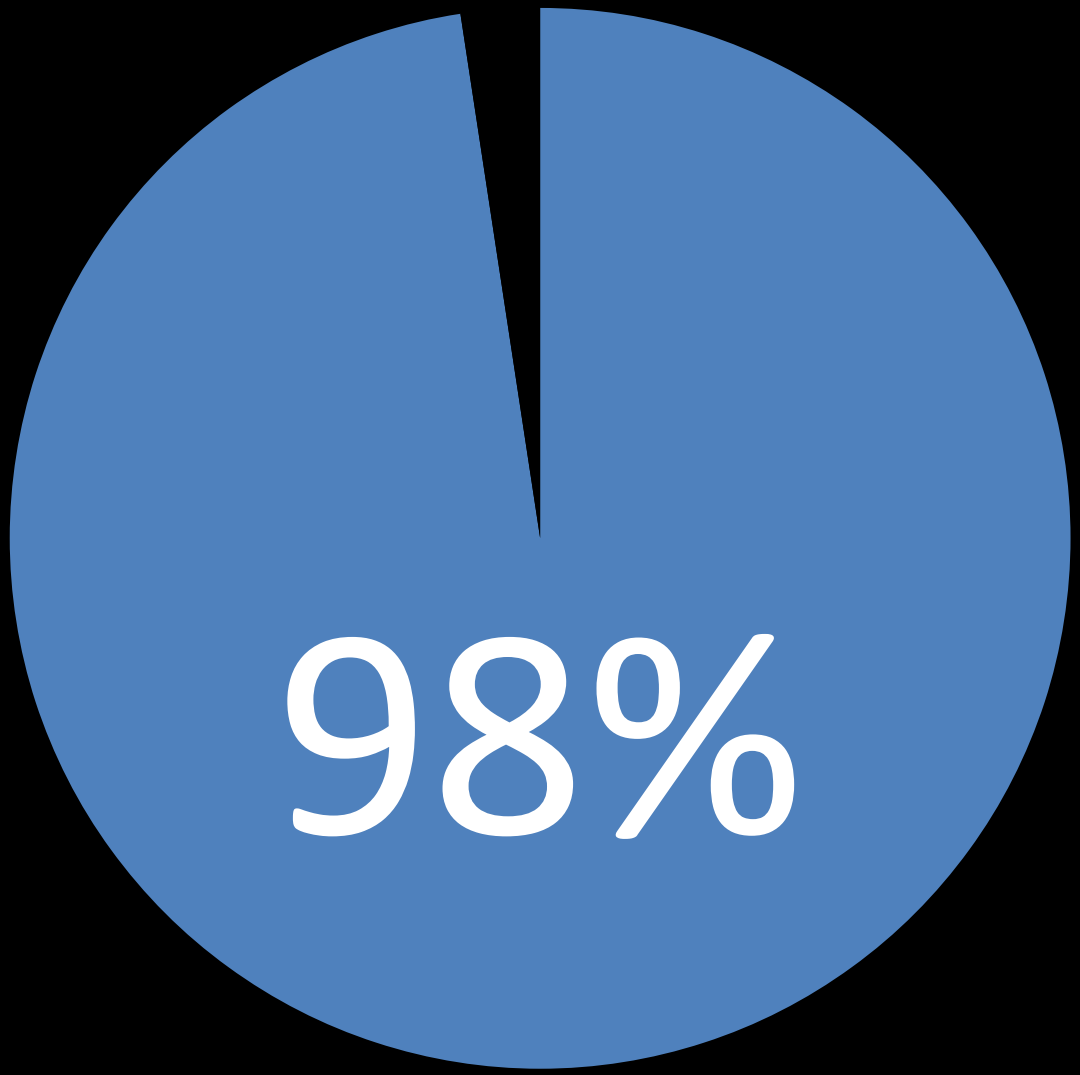
Economic considerations are causing an energy revolution

Fossil fuel prices go up

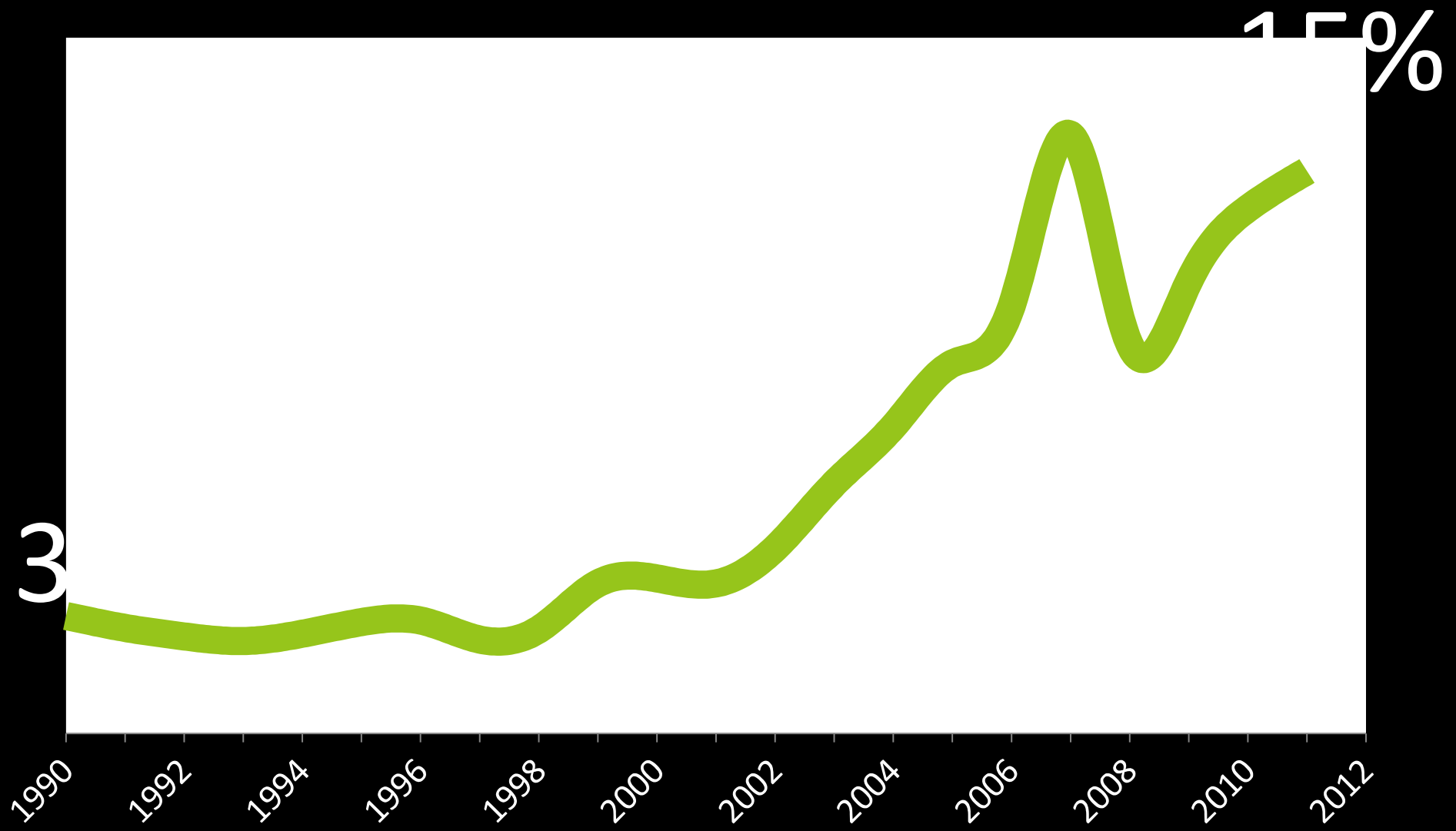


Fossil Prices go up

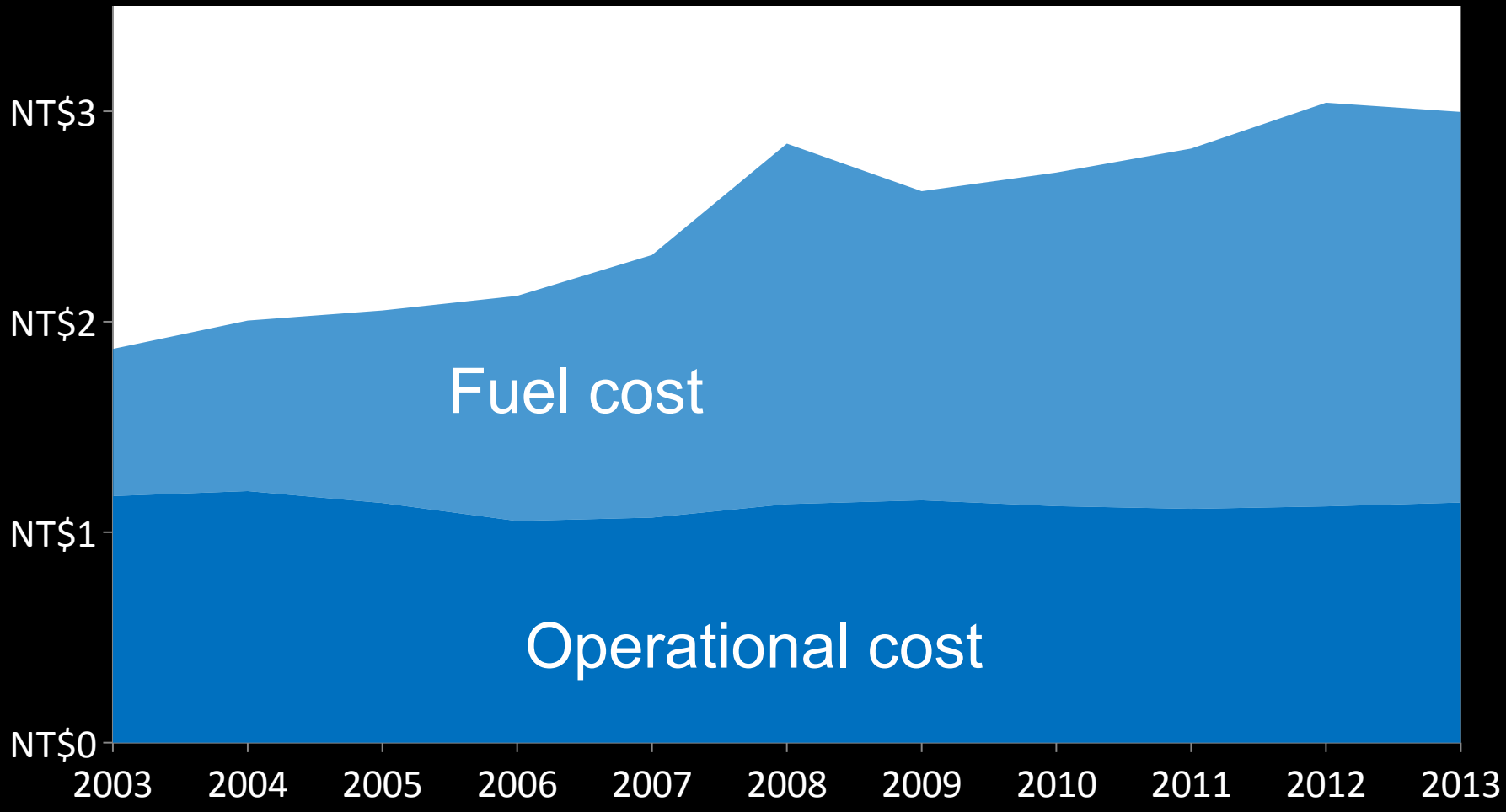
Taiwan percentage imported energy



Taiwan energy imports as percentage of GDP

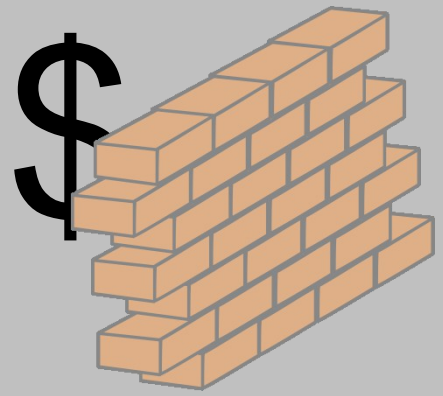


Taiwan Power Company
Electricity generation Cost per kWh

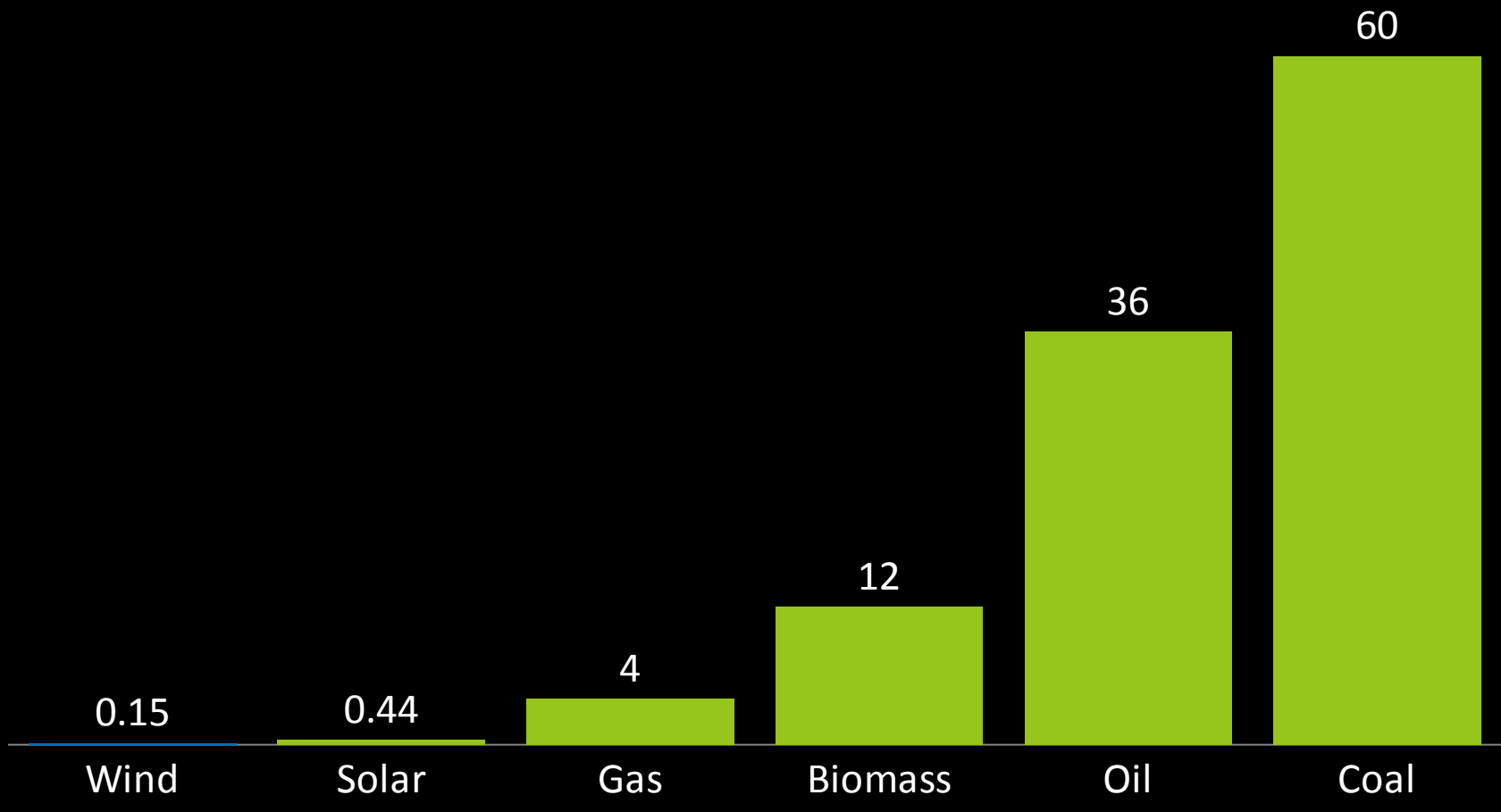


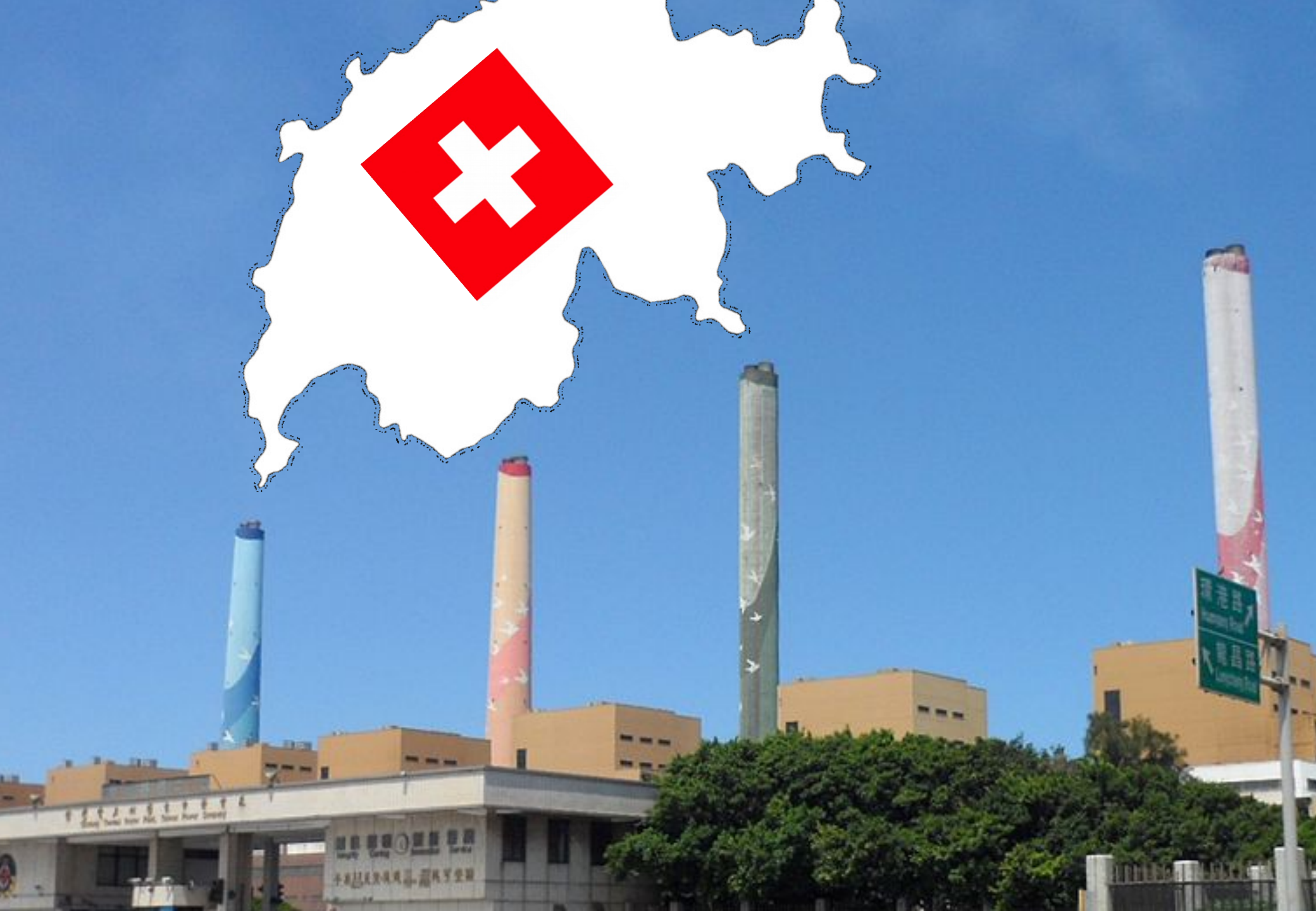
Source: www.taipower.com.tw

Hidden costs



Deaths per TWh





Folsom Lake - July 20, 2011

Folsom Lake - January 16, 2014

Renewable prices go down

Cheap

Anja

“Anja”

Produced half of the energy of a turbine in Germany

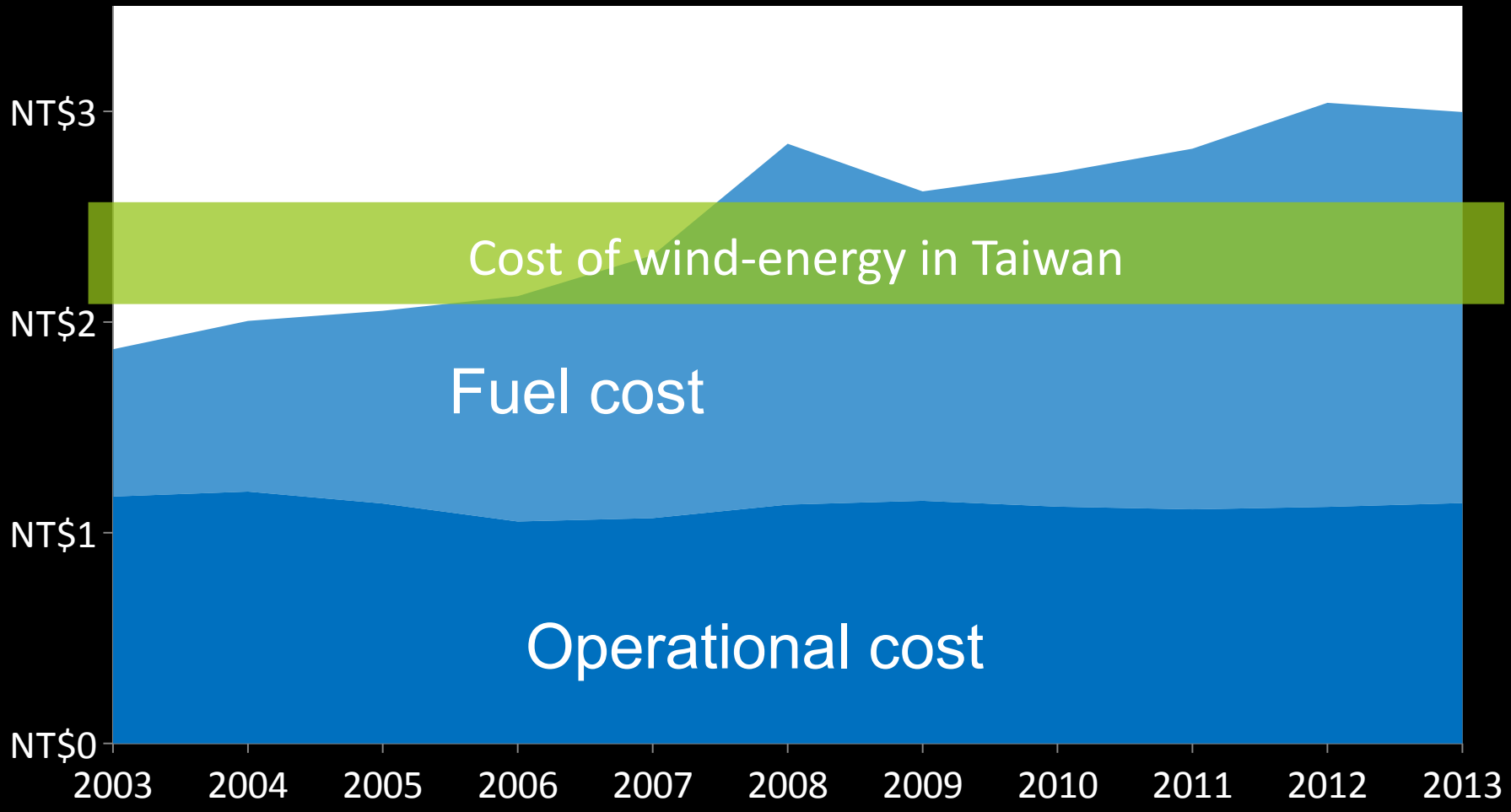
Operating at 20% of its capacity

Same for our other 182 wind turbines in Taiwan

Kate Modesta Vito Bong Lorette Nannette Margarette Adelia Arletha Marya Mellie Tianna Dominque Caroyln Estell Genesis Winter Benjamin Niki Weston Kathie Arnette Cecil Ashlie Jose Eladia Colin Mirian Yon Bettina Fabiola Sona Yolanda Deangelo Erica Irwin Nicolas Elsa Velda Delpha Blaine Gino Diana Tinisha Roxann Sadie Margarete Fiona Kimbra Olga Kiana Cory Aleida Fernande Marcellus Remedios Junko Kristofer Angela Olinda Hildegarde Rozella Amelia Alexa Laurinda Theodore Don Faustina Penny Samira Marguerite Randolph Daryl Trina Kaitlyn Oneida Deloise Angelika Carin Chang Skye Asia Floyd Israel Aleida Bernadette Ted Felice Regine Monroe Noriko Isobel Laverna Candi Myong Beatris Ricki Marinda Artie Lottie Isidro Machelle Shari Tyler Ginger Duane Meda Shannan Hettie Brittanie Lino Jacqueline Eli Rich Brigitte Sunny Vita Nelda Laura Vennie Ilana Kristle Leota Katlyn Hsiu Percy Carley Lawerence Cherlyn Rhiannon Melania Devona Sofia Windy Krysta Brook Miesha Jalisa Kandice Noreen Claudette Chante Art Elfrieda Jill Shanita Setsuko Matilda Orlando Jean Cherelle Nona Sherwood Carleen Therese Rod Cinderella Aletha Wai Sal Phyllis Sherita Lin Roseann Hellen Marquitta Reatha Manda Maryam Jacquelyne Claudette Elva Arletha Lakenya Monet Garland Isaiah Oma Lenita Bernadette

Cheaper

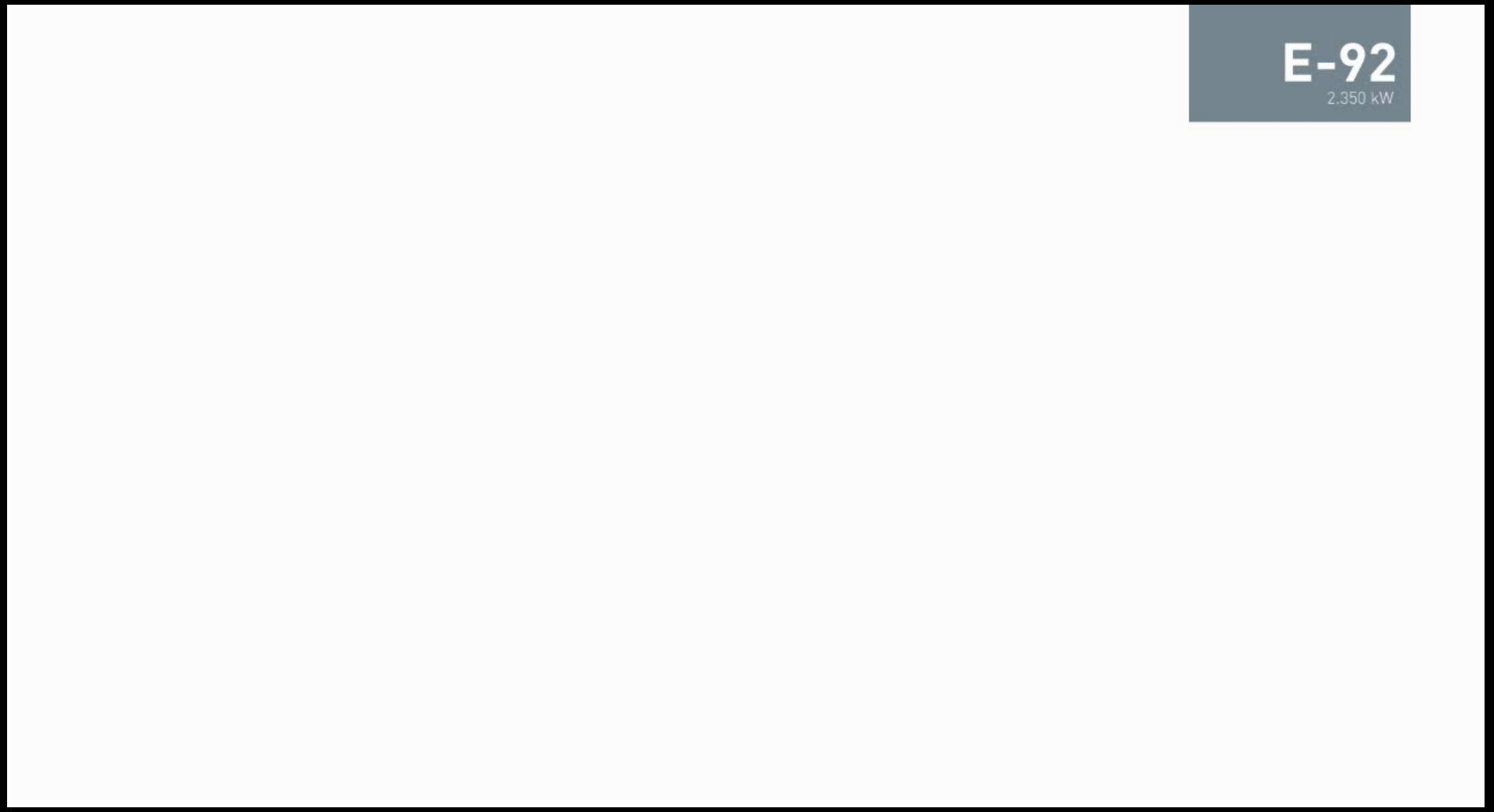
Taiwan Power Company
Electricity generation Cost per kWh



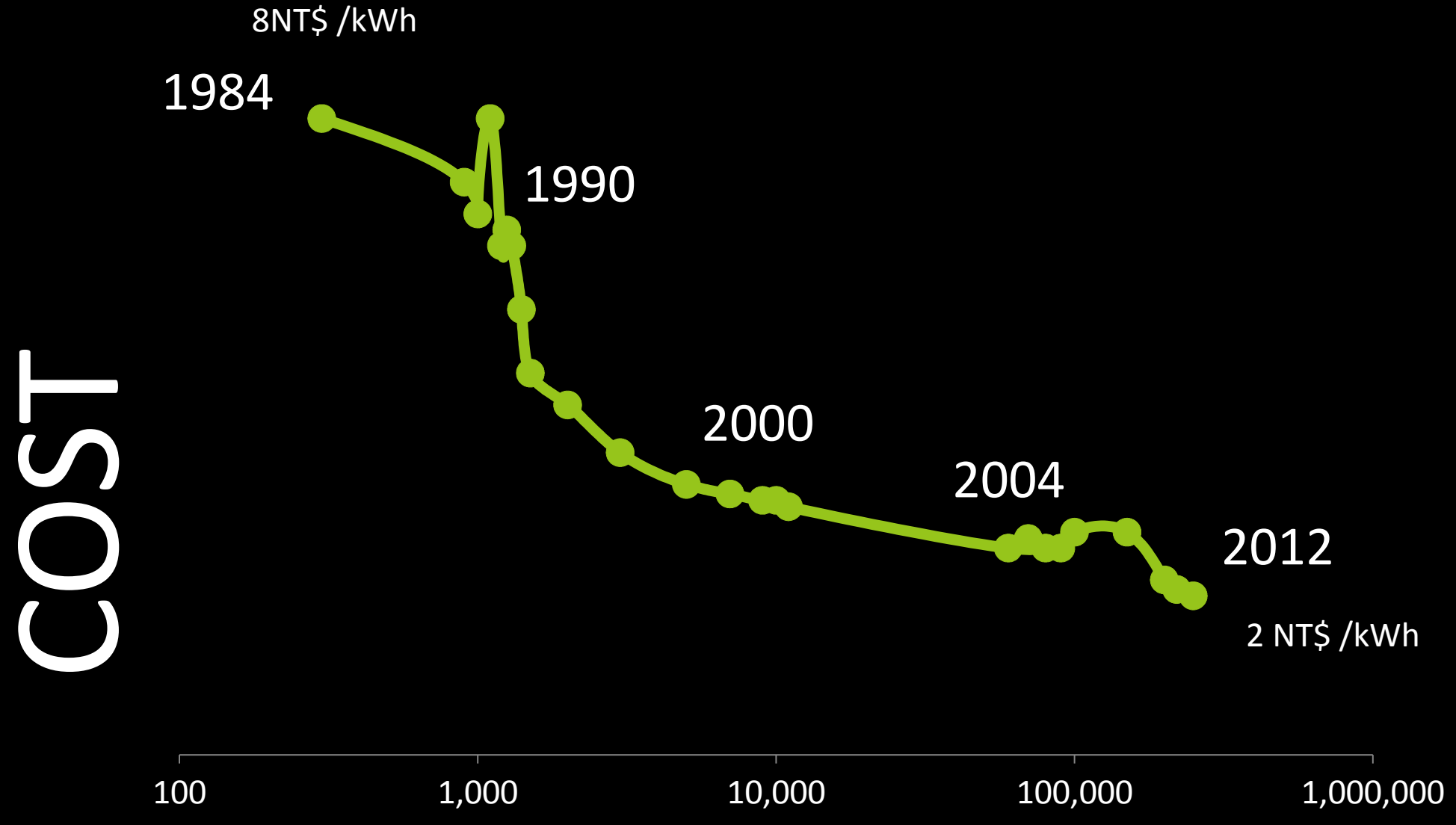
Source: www.taipower.com.tw

Cheapest

Continuous performance improvement



Wind-energy cost per unit of Electricity kWh

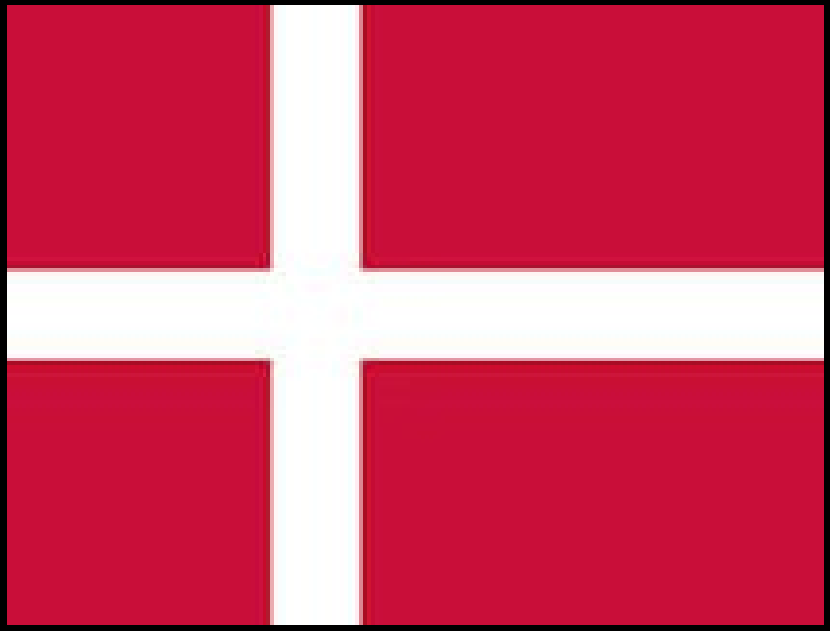


Source: Michael Liebreich – Bloomberg New Energy Finance

The Energy revolution

Countries

Denmark



35% renewable electricity in 2013
50% renewable electricity by 2020
100% renewable electricity and heat by 2035
100% renewable transport by 2050

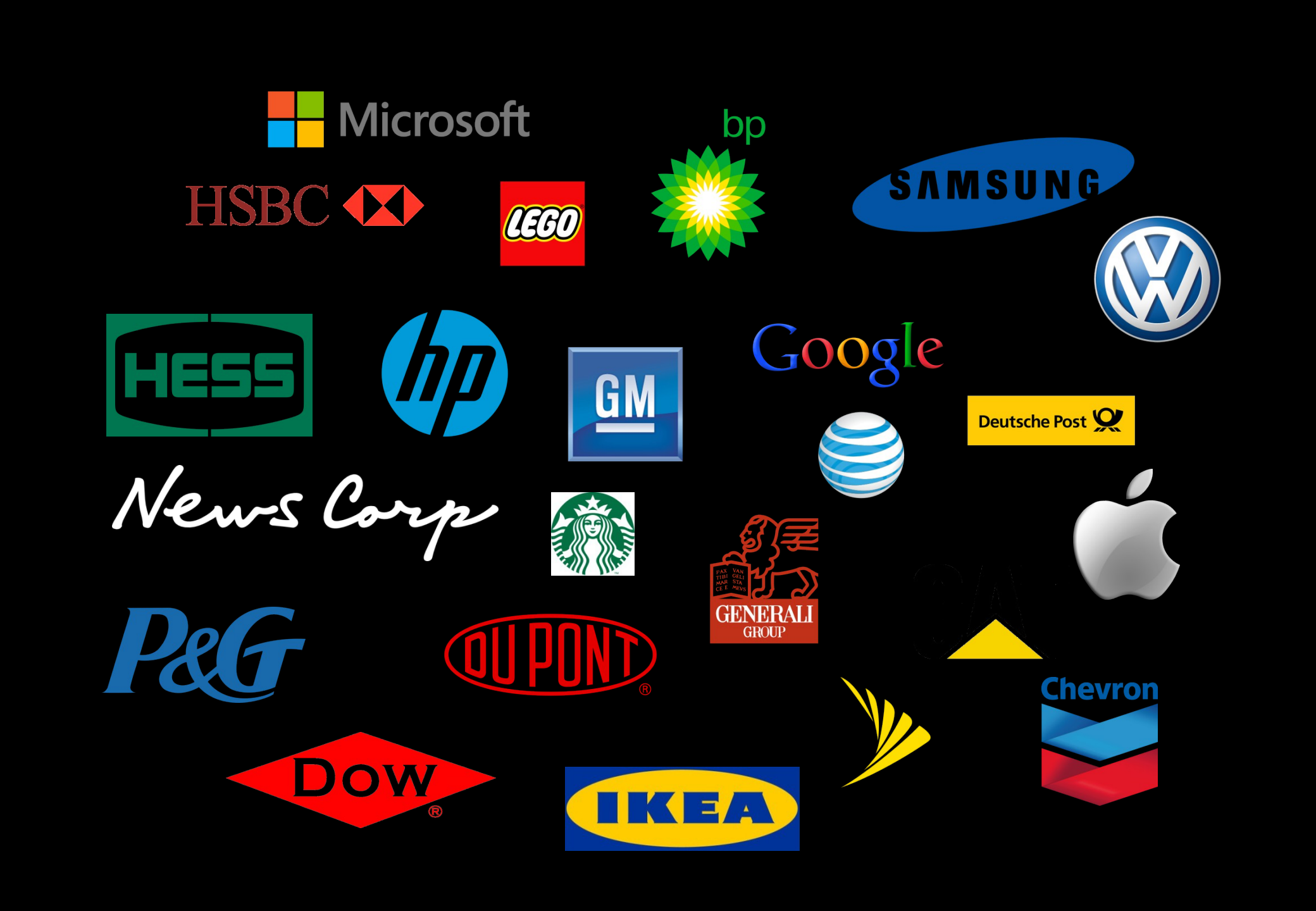
Denmark

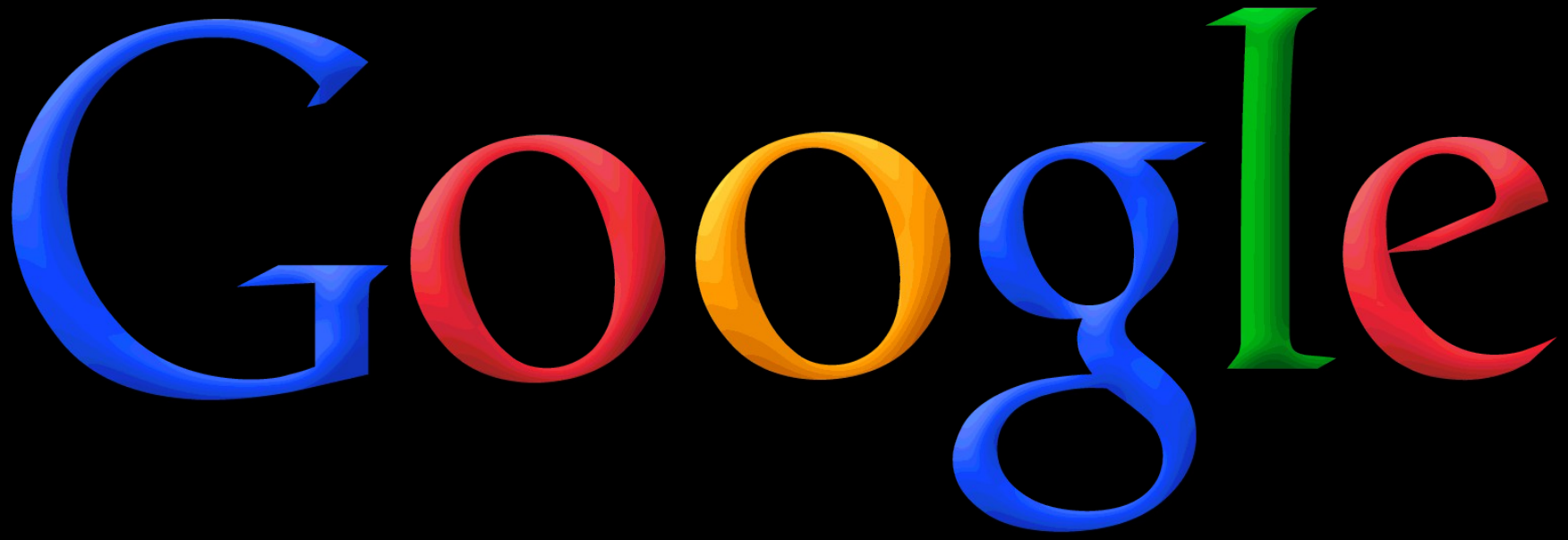
35% renewable electricity in 2020
80% renewable electricity by 2050

Texas

5,300 MW of windenergy by 2015

Business


Microsoft
bp
HSBC
LEGO
SAMSUNG
HESS
hp
GM
Google
Deutsche Post
News Corp
GENERALI GROUP
P&G
DUPONT
Chevron
DOW
IKEA



100% renewable

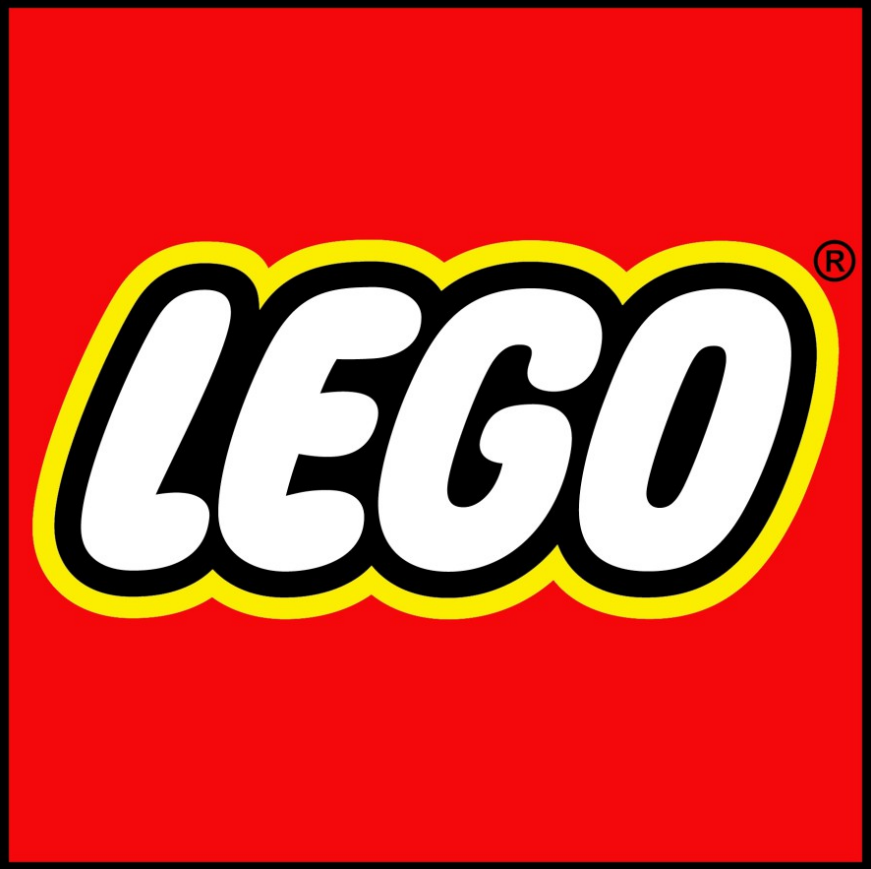
Invests 1 billion US$ in renewables – most in on-shore wind

100% renewable by 2020

Invests 2.5 billion Euro in renewables by 2015 – most in on-shore wind

IKEA owns 137 wind-turbines

Reduce greenhouse gas emissions by 40 percent by 2020
Volkswagen invests 1.5 Billion Euro in wind energy

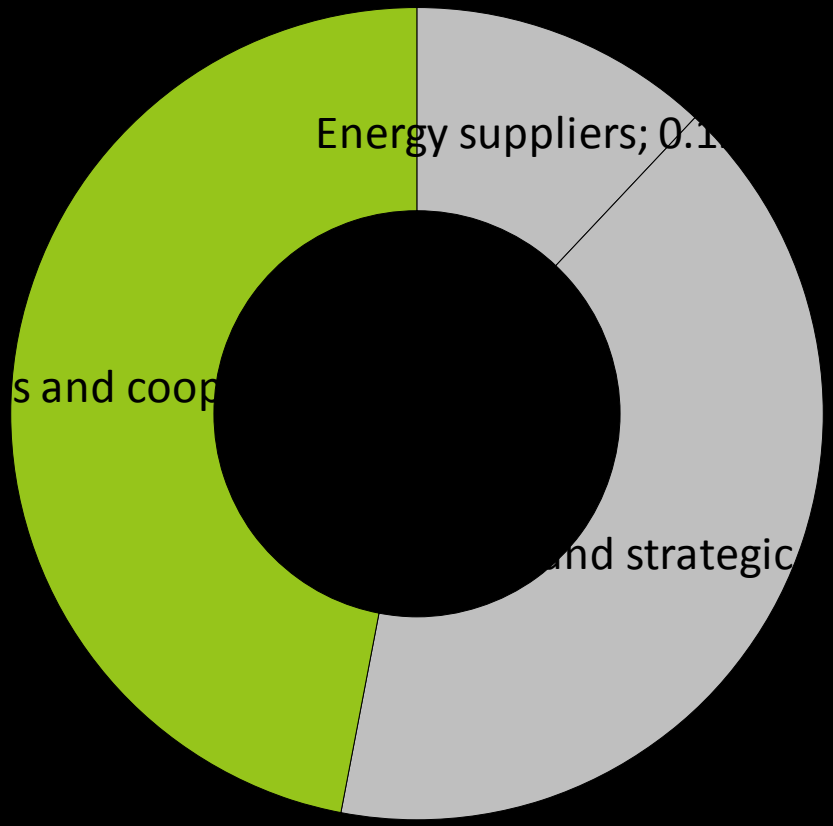


100% renewable by 2020

100% renewable electricity by 2015

Communities

Germany renewable energy investment



Windpark
Noordoostpolder

buitengewoon
NOORDOOSTPOLDER

geeft Nederland nieuwe energie

86 windmolens

In het water en op het land

groene stroom voor

400.000 huishoudens

WINDPARKNOORDOOSTPOLDER.NL

Opdrachtgevers:

NOP Agrowind

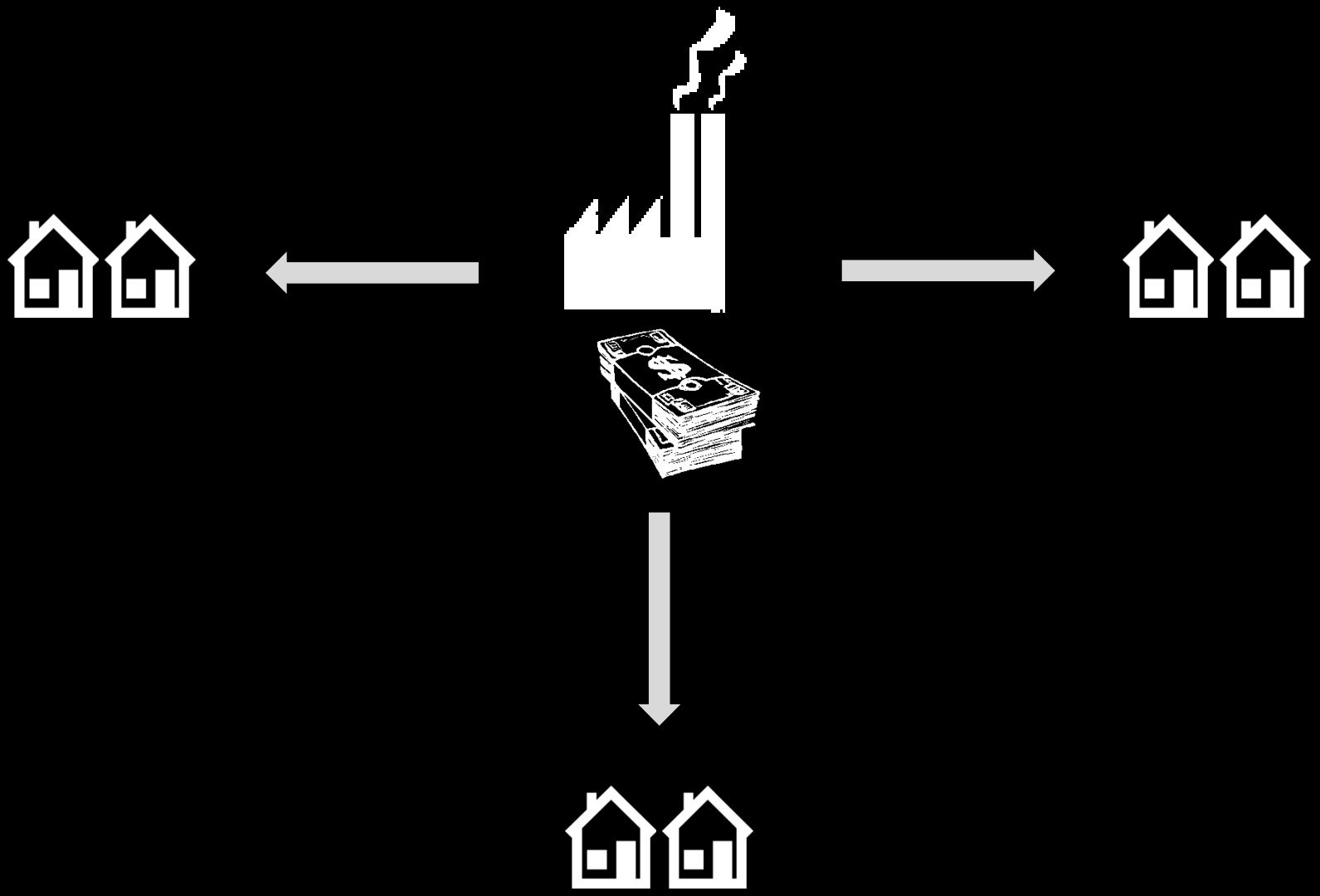
RWE

WESTERMEERWIND BV

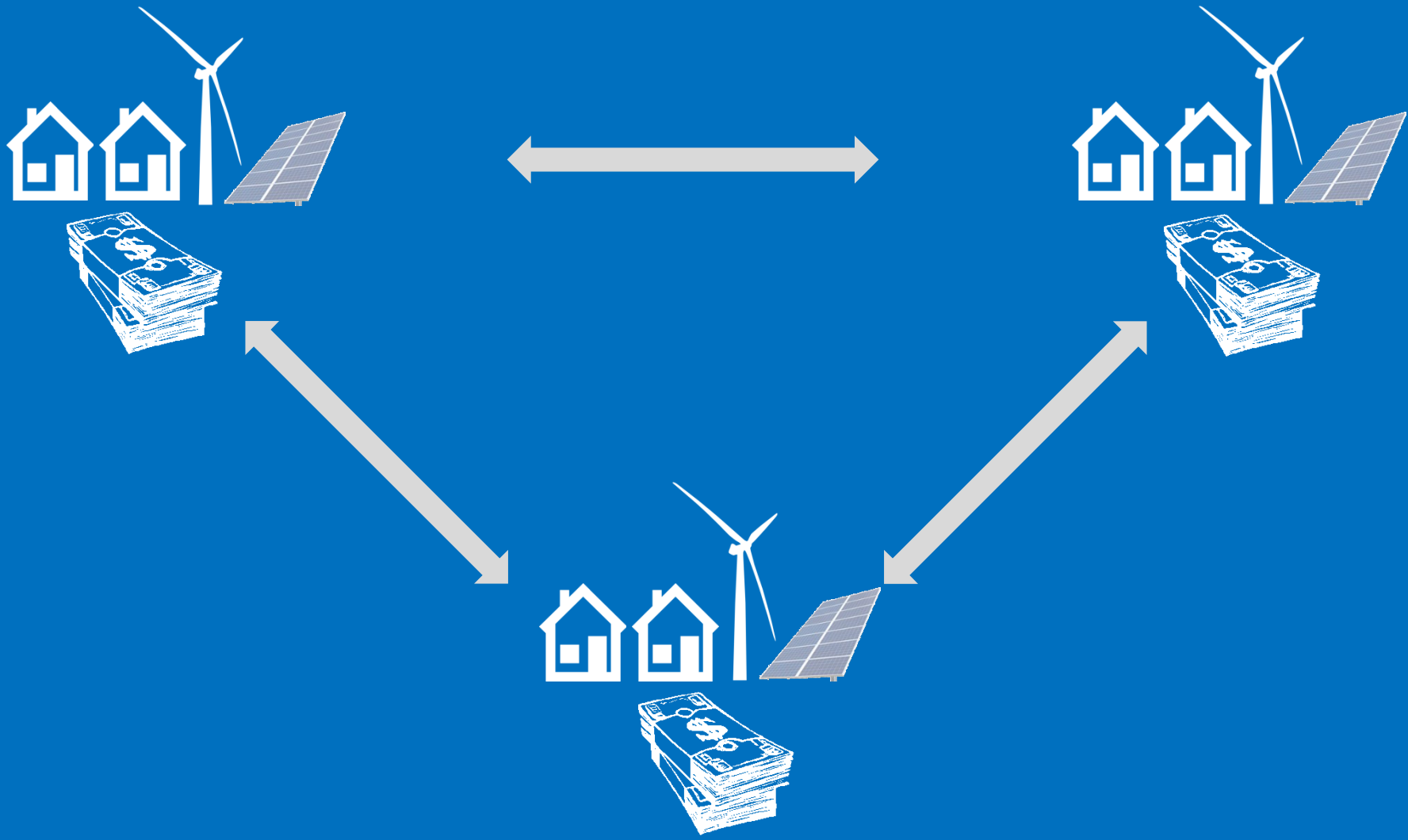
Netaansluiting:

TenneT
Taking power further

From Centralized Energy



To Power to the people



Are you ready to flick the switch?

LOW CARBON
INITIATIVE