



ENGIE South East Asia

**Your Partner in
District Cooling Systems (DCS)**

**APEC Workshop on District Cooling and/or Heating
Systems
EWG 08 2019S**

APEC aims to reduce energy intensity by at least **45 percent** by 2035.

ENGIE - A GLOBAL LEADING INTEGRATED ENERGY SOLUTIONS PROVIDER

ENGIE supports Government, Commercial and Industrial businesses towards the transition to a carbon neutral economy

Energy Production

No.1

Independent Power
Producer globally

24.4 GW
of Renewable Energy



+ 9 GW
by 2021

Energy Distribution

No.1

Gas infrastructure
in Europe

287,000 km
of network
worldwide



€ 3 bn
Investment by 2021

Energy Services

No.1

Global Cold and Hot
network provider

€ 19 bn
of revenue in 2019



€ 11 – 12 bn
Investment in energy transition
on behalf of our clients

In 2019:

€ 60.1
billion revenue

171,100
employees

70
countries



Introduction to District Cooling Systems

HOW DOES IT WORK?

They have **many advantages** over standard air conditioning units:



CO₂

↓ -50%

ENGIE

DCS: A modern and efficient way to air-condition clusters of buildings

5

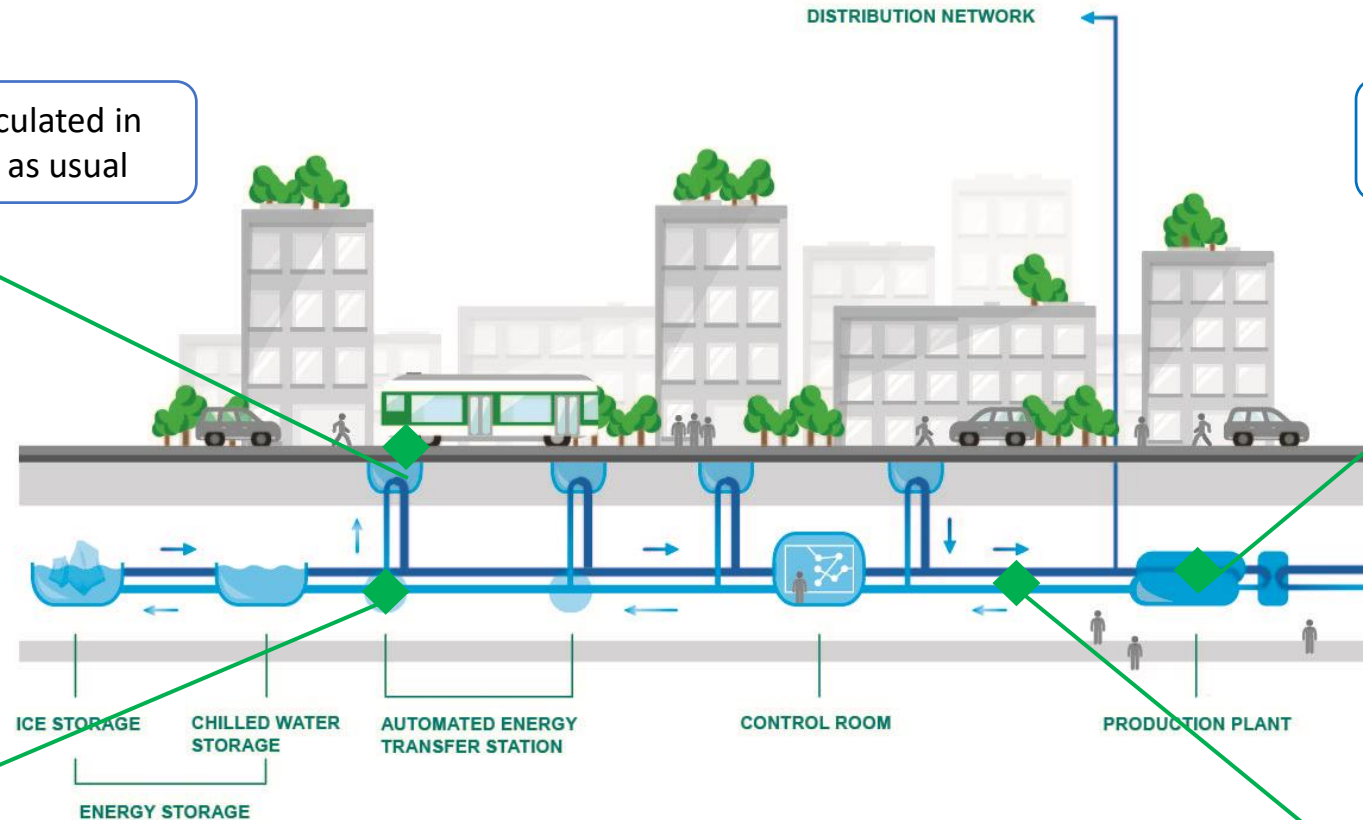
ENGIE can deploy the latest technologies such as storage or free cooling to further improve efficiency

4

Chilled water will be circulated in the buildings, business as usual

1

Central chilled water plant produces chilled water



3

Connecting to the building at a transfer station

2

Which is supplied to the building via pipeline



Key Benefits of District Cooling Systems

Why District cooling Systems?



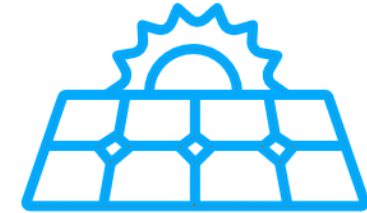
Efficient & Cost Effective

DCS is a highly efficient and cost effective solution to supplying air conditioning, making districts attractive



Technical Expert

ENGIE is a global leader in DCS, operating the largest and complex DCS worldwide



Freeing up Space

Frees up valuable rooftops and building space for other usage

Why District cooling Systems?

There are several Key Benefits of a DCS vs. conventional chilled water production system:

 <p>Less electricity consumption</p>	 <p>Less CO2 emission</p>	 <p>More energy efficiency</p>
 <p>Less water consumption</p>	 <p>Less chemical usage</p>	 <p>Ability to use alternative renewable fuel</p>
 <p>Create a commercial edge to attract new businesses into the area</p>	 <p>Free up existing building space for other usage</p>	 <p>Reduction of heat rejection at city level</p>
 <p>Evolvability – network and capacity of chilled water production are able to grow according to future demands</p>	 <p>Allowing businesses & local authorities to move towards zero-carbon transition</p>	 <p>Economies of scale for densely populated areas</p>

Benefits of Brownfield DCS



“The success of the Northgate Cyberzone DCS is an important milestone for PDDC... it gives Northgate a substantial commercial edge to attract new tenants within their IT Park and is in line with the government of Philippines’ drive towards green energy.

- Infrastructure Asia



Minimize environmental impact right in the city centre

DCS improve Energy Efficiency and reduce energy consumption , we will see an even greater impact in densely populated areas. This not only save electricity bills, but it also aligns with ENGIE’s and territories vision of a **greener city of the future**.



Urban heat island phenomenon

Densely populated area such as city center are getting warmer. **Brownfield DCS allows reduction of heat rejection** and city center can be cooled down more effectively.



Attract new business into the area

Freeing up of building space and **creating a commercial edge on more developed areas in the city** and attract new businesses into the area. Existing tenants can also enjoy immediate benefits on cost savings from day 1.



Minimize the risk of offtake

Capacity of chilled water production and length of network are **sized to meet the exact demand of the buildings**. This will ensure customers would not be overcharged for any oversized systems and allow city planners to better forecast city requirements.



Actions needed to develop DCS

How to support development of a DCS?

The importance of APEC cities in initiating projects

Cities initiating district network thanks to changes in policy or **major public events**

Cities/Public authorities play a fundamental role as a regulator and a market facilitator.

Public can also ensure **financial profitability** by acting as a client and guaranteeing connections.

The area must be **attractive**.

How to make it grow?

Cities can also influence the orientations taken by the network

Municipal policies can provide incentives

The network **must keep a competitive advantage** when compared to stand-alone basis

Financing the project through public and private involvement

Different **financing structures are possible** for DCS projects :

- Through public investment
- Through public incentives
- Through SPV with public actor
- Through wholly private financing



Key References in DCS

ENGIE is the world leader in DCS

UNIQUE POSITIONING

World leader in District Cooling, with several key projects :

- **Tabreed** the leading operator of DCS in the Middle East.
- **Climespace**, Paris DCS
- **London Olympics** scheme



€2.4 billion Turnover in 2019



5 Centres of Expertise world wide



Over **350** District Energy Schemes under operations worldwide



Over **1.3m RT** delivered to clients



DCS IS A KEY GROWTH SECTOR FOR ENGIE IN APEC MEMBER ECONOMIES

Member Economies of APEC in the APAC region include Singapore, Malaysia and the Philippines

APAC is home to one of the **5 centers of expertise worldwide** with the objective of developing local DCS expertise in the region

There are currently **2 networks in operations and 2 under development**



64,000 RT delivered to clients



Over **20KM** of distribution network



18,000 tons of CO2 emission avoided per year



Malaysia

*Megajana DCS :
22,000 RT & 51 Buildings*



Singapore

*JTC DCS: 22,000 RT
SIT DCS: 7,800 RT
2 plants under development*

Philippines

*Northgate DCS:
12,000 RT & 16 Buildings*

1st Brownfield District Cooling project in the Philippines



#ActWithENGIE

**Let's work together towards a
Carbon-neutral Future**