



تحت رعاية معالي رئيس مجلس الوزراء المصري المهندس شريف إسماعيل
مؤتمر تحلية المياه الحادي عشر في البلدان العربية

UNDER THE PATRONAGE OF THE EGYPTIAN PRIME MINISTER ENGINEER SHERIF ISMAIL

11TH WATER DESALINATION CONFERENCE IN THE ARAB COUNTRIES

18-19 APRIL 2017 • INTERCONTINENTAL CITY STARS - CAIRO - EGYPT

Alliance of Deepening Local Manufacturing in Water Desalination (ASRT Funded Project)

Hosam A. Shawky
PI, Water Desalination Alliance
Director, Egyptian Desalination Research Center of Excellence (EDRC)
Desert Research Center
Member, Water & Irrigation Research Council (ASRT)

بالتعاون مع



وزارة الإسكان والمرافق والمجمعات العمرانية

تنظيم

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متعاونوا الدورات السابقة



OUTLINES

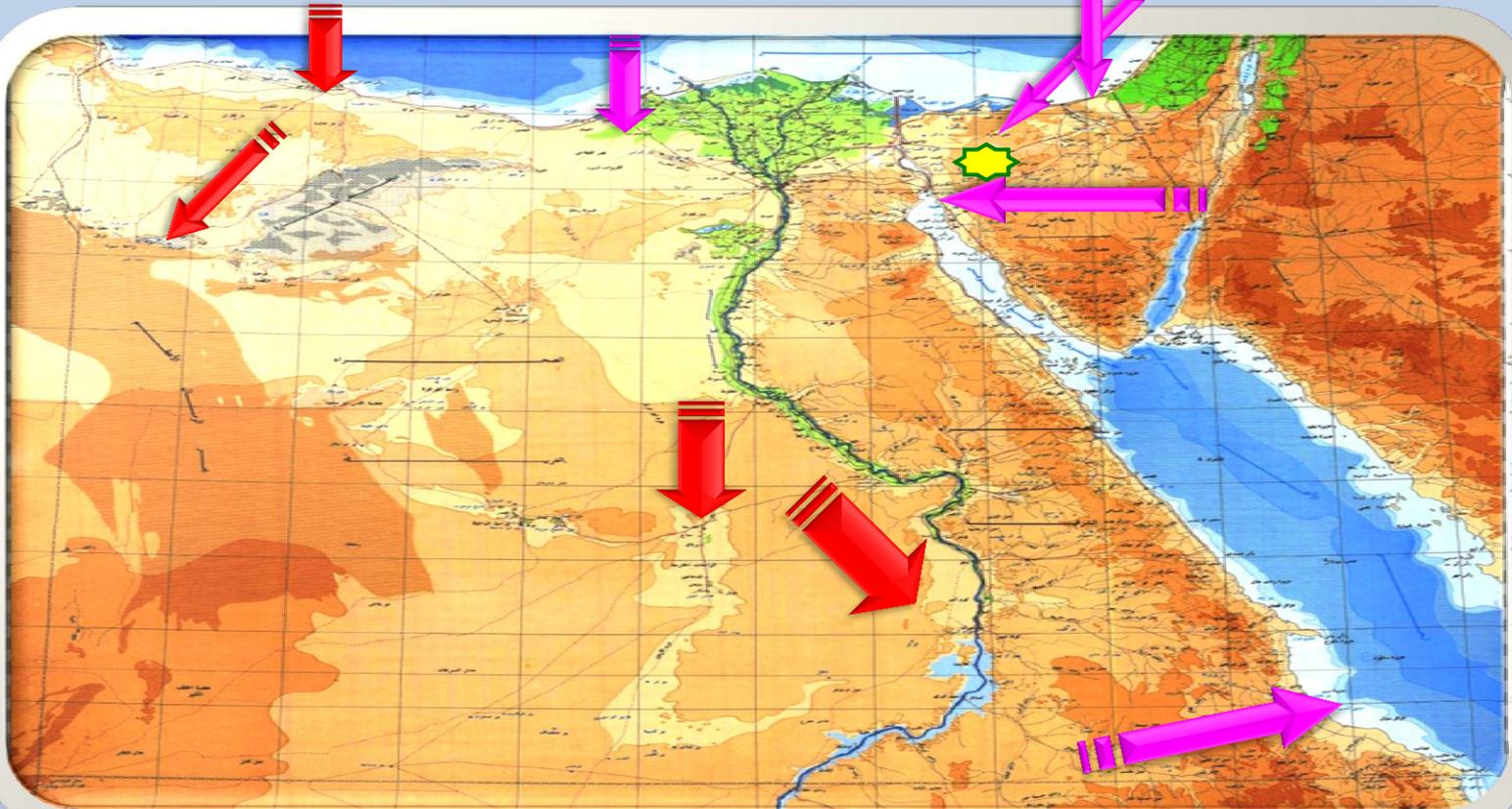
- 1 WHY DESALINATION?**
- 2 SMALL SCALE DESALINATION UNITS FOR SUSTAINABLE DEVELOPMENT**
- 3 EGYPT DESALINATION RESEARCH CENTER OF EXCELLENCE (EDRC)**
- 4 EGYPT WATER DESALINATION ALLIANCE**

DESERT RESEARCH CENTER (DRC)

- ❑ Water Resources and Desert Soils;
- ❑ Ecology and Dry Land;
- ❑ Animal and Poultry Production;
- ❑ Socio-economic Studies.



DRC RESEARCH STATIONS



OUTLINES

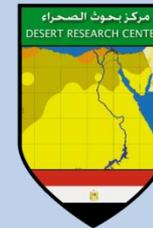
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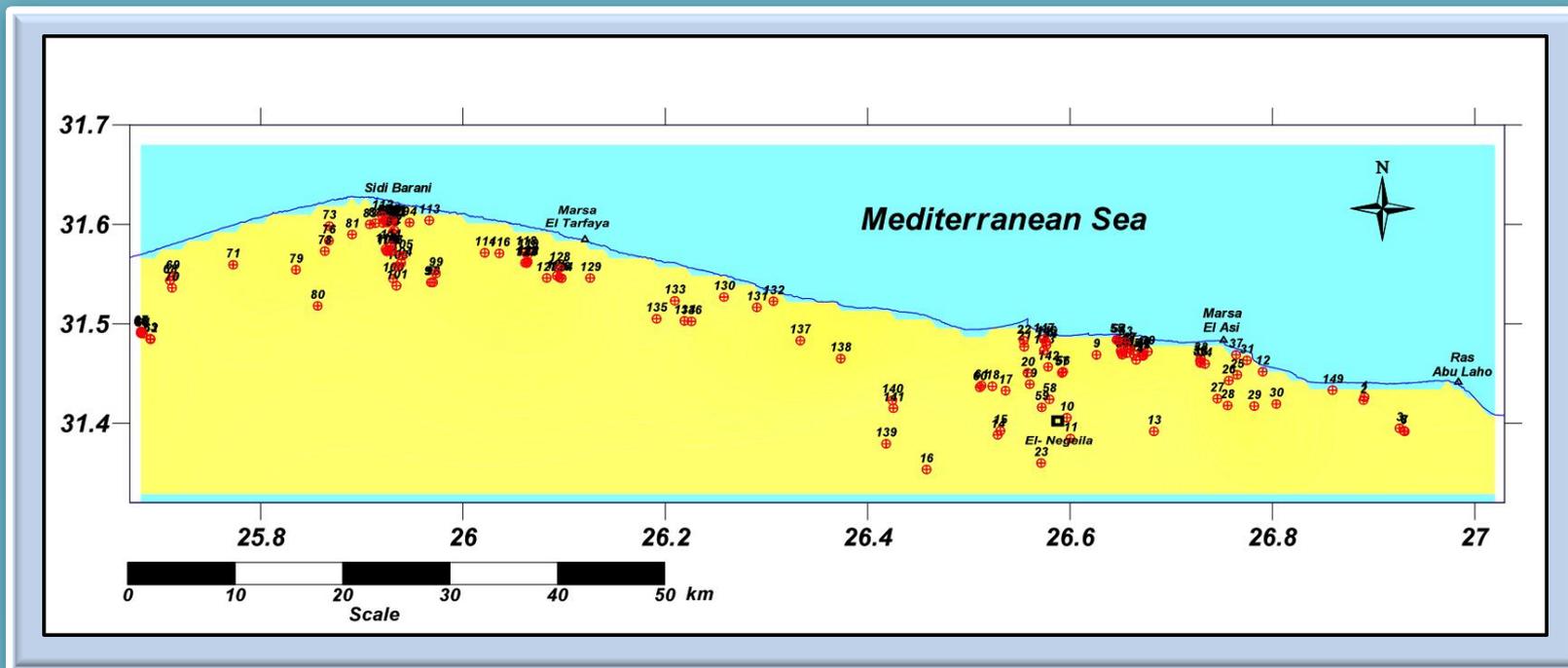


SMALL SCALE DESALINATION UNITS FOR SUSTAINABLE DEVELOPMENT

LOCAL DEVELOPMENT AND MANUFACTURING OF A SMALL MOBILE SOLAR RO WATER DESALINATION PLANT TO BE DEPLOYED IN NORTHWEST COAST OF EGYPT

PI: HOSAM AHMED SHAWKY

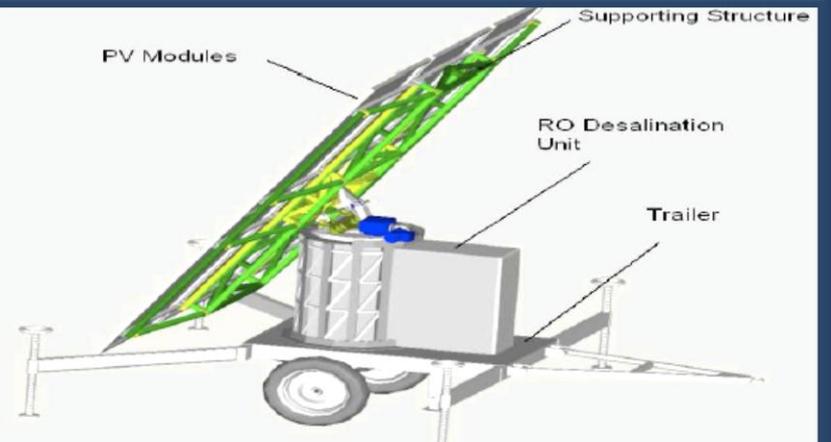




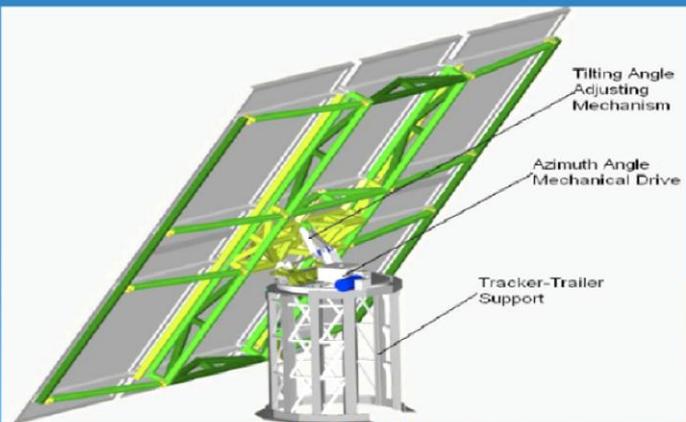
Transportation Mode



Dr.Amr Abdel Kader

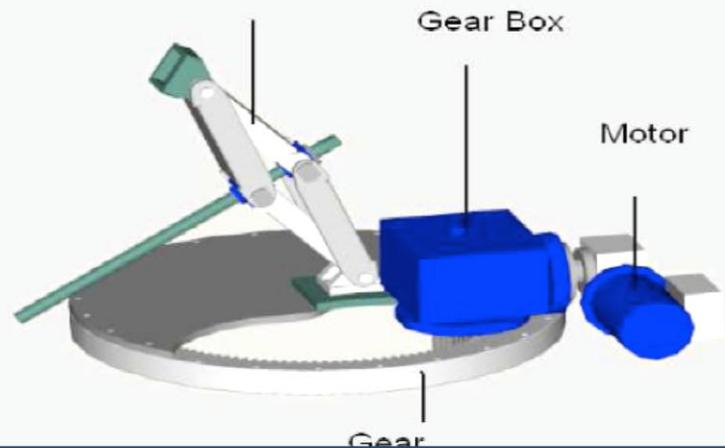


Main Structure



Dr.Amr Abdel Kader

Tilt Angle Adjusting Mechanism





DEVELOPMENT OF A MOBILE STAND-ALONE SOLAR DRIVEN REVERSE OSMOSIS SEAWATER DESALINATION PLANT FOR SUSTAINABLE DEVELOPMENT IN SHALATEEN

PI: HOSAM AHMED SHAWKY













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EGYPT DESALINATION RESEARCH CENTER OF EXCELLENCE (EDRC)

PI: HOSAM AHMED SHAWKY



صندوق العلوم والتنمية التكنولوجية
Science and Technology Development Fund



Egyptian Desalination Research Center of Excellence





HISTORY OF DESERT RESEARCH CENTER WITH DESALINATION

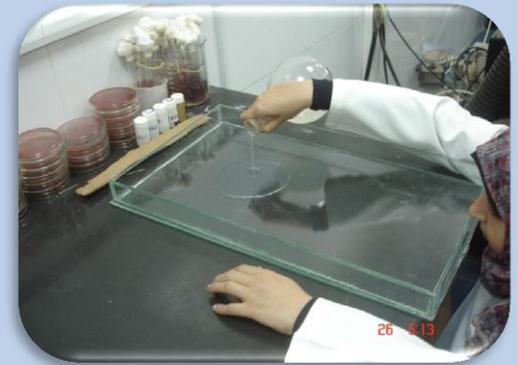
SMALL LAB-SCALE 9 CM DIAMETER



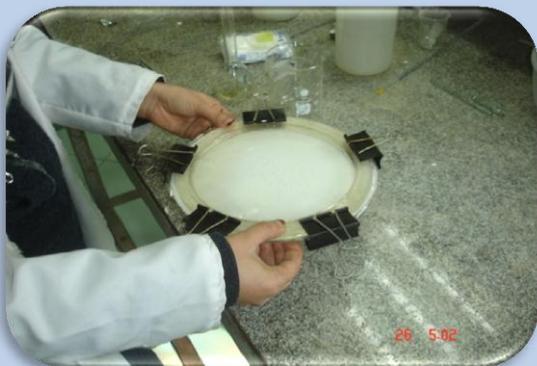
22 CM DIAMETER CELLULOSE ACETATE



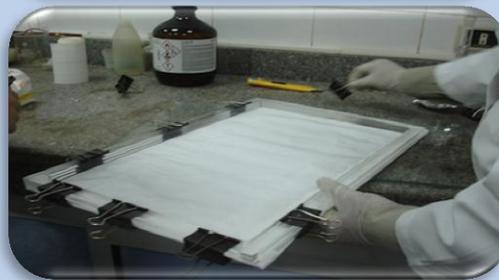
CA 30 X 50 CM DIMENSION MEMBRANE



22 CM DIAMETER PS/TFC



30 X 50 CM DIMENSION PA-TFC MEMBRANE



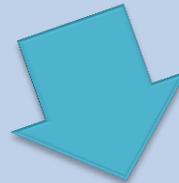
MISSION OF EDRC

Conduct research for the development of cost effective, robust desalination technologies.

Bring together scientists, engineers, water policy-makers and water system operators in Egypt, Middle East and Africa.

MAIN GOALS OF EDRC

Infrastructure for; preparation, characterization and performance of different membrane types.



Local fabrication of spiral-wound reverse osmosis (1.8'' x 12.5'') membrane element.





Forward
Osmosis
System

Membrane
Distillation
System



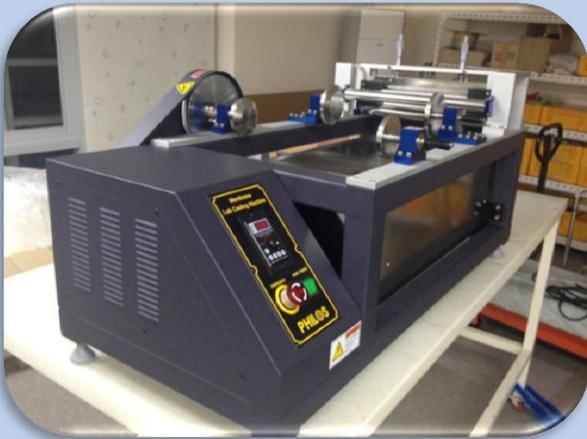
Reverse
Osmosis
System



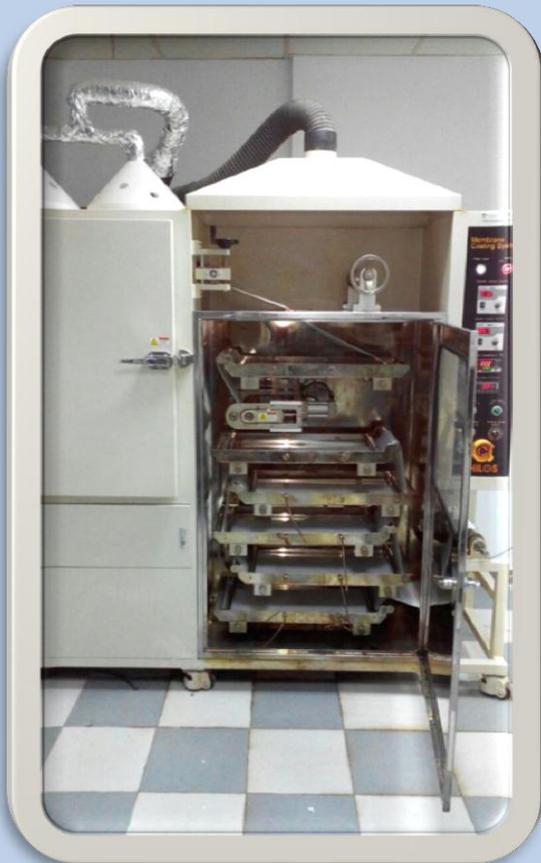
LOCAL MANUFACTURING OF SPIRAL- WOUND RO ELEMENT



CASTING LINE FOR CONTINUOUS FLOW PS SUPPORTING MEMBRANE MANUFACTURE



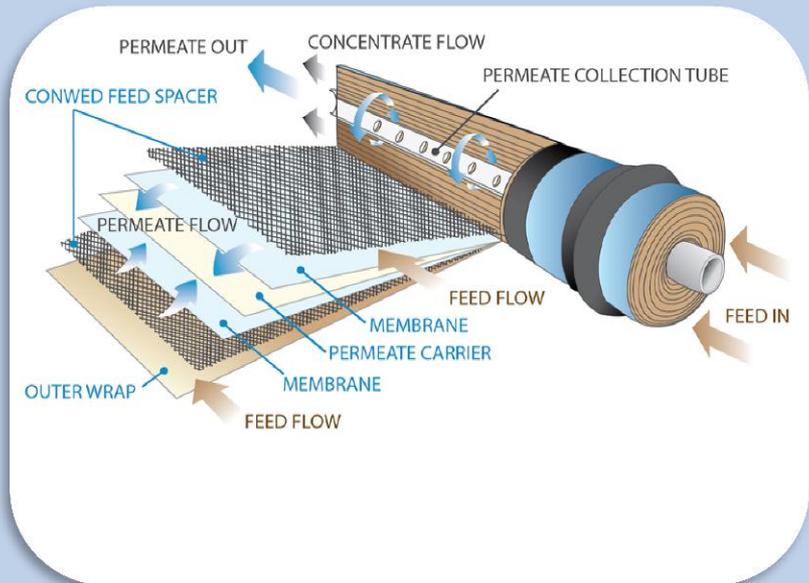
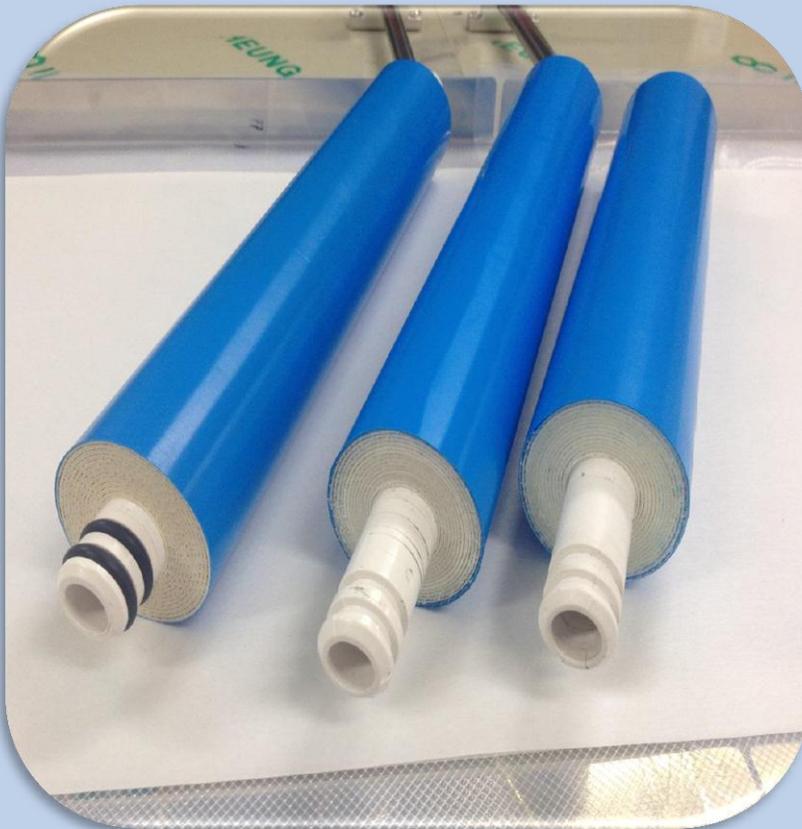
COATING LINE FOR CONTINUOUS FLOW
PRODUCTION OF TFC-RO MEMBRANE SHEET



RO Element rolling



Local manufactured RO element



Element Results



Pressure (bar)	EDRC membrane		Commercial membrane (Seaps)		Commercial membrane (Sol.Tec)	
	Flux (L/m ² .h)	R _s %	Flux (L/m ² .h)	R _s %	Flux (L/m ² .h)	R _s %
5	17.78	90.5	4.62	91.3	7.4	80
10	38.89	94.7	6.38	96	19.1	84
15	58.89	95.4	11	97	28.1	92

Flat sheet membranes, NaCl 2000 ppm at different applied pressure



1.8'' spiral-wound RO element at different applied pressure

Pressure (bar)	EDRC Element		Commercial element (Seaps)	
	Flux (L/day)	R _s %	Flux (L/day)	R _s %
5	186	92.3	259	82
7	197	95.5	345	84

OUTLINES

1

WHY DESALINATION?

2

**SMALL SCALE DESALINATION UNITS FOR
SUSTAINABLE DEVELOPMENT**

3

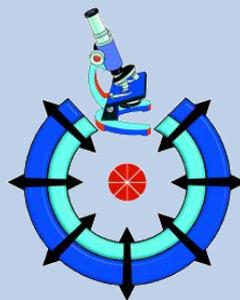
**EGYPT DESALINATION RESEARCH CENTER
OF EXCELLENCE (EDRC)**

4

EGYPT WATER DESALINATION ALLIANCE

WATER DESALINATION ALLIANCE

PI: HOSAM AHMED SHAWKY



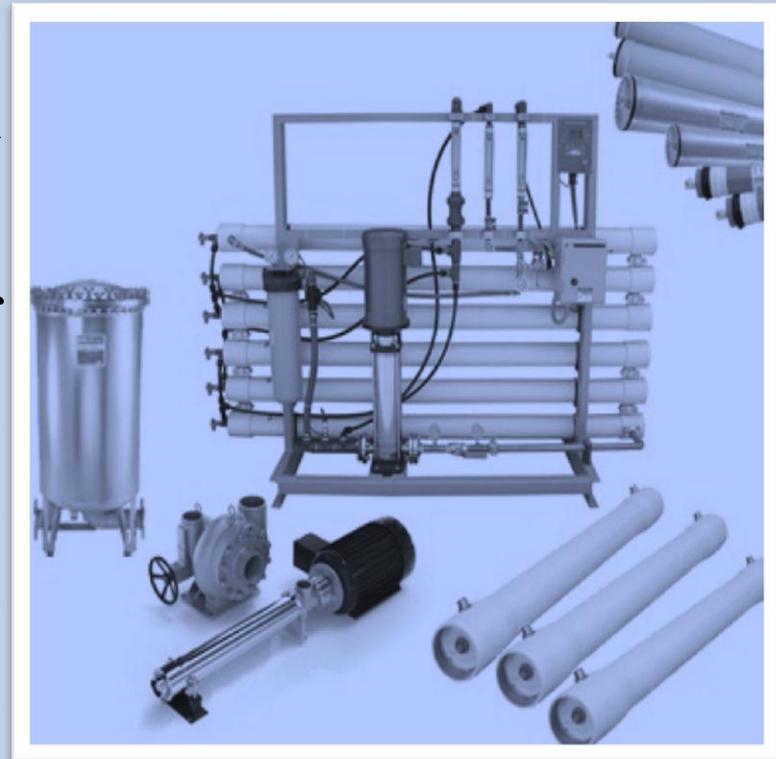


WATER DESALINATION ALLIANCE



WATER DESALINATION ALLIANCE

The main aim of the Alliance will be to exchange knowledge and to reduce the unit cost of water through local manufacturing of desalination equipment. Achievement of such aim will depend on the collaboration of the partners either individually or as small or large groups. Personal and infrastructure capabilities of different partners will assure the success of the Alliance's target.



TASK 1

Design and manufacturing of 4x40" and 8 x 40" spiral wound RO membrane element production line

**Assuit university
(Group leader)**

DRC

COE

Sakr factory

Factory 270

TASK 2

Rolling of 4x40" and 8 x 40" spiral wound RO membrane element

**Desert Research Center
(Group leader)**

**Assuit
University**

ADST

TASK 3

Synthesis of enhanced spiral wound RO element by nano technology

**Desert Research Center
(Group leader)**

**Higher institute-Alex
University**

ADST

TASK 4

**Design and manufacturing of 150-200
m³/h high pressure pump**

BUE
(Group leader)

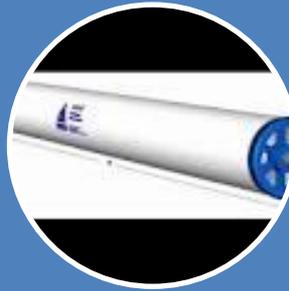
Sakr factory

ARECO

Alliance outputs



8 " spiral-
wound element



4 " spiral-
wound element



High pressure
pump
(200 m³/h)



THANKS

