





Regional Conference on "Decentralized Renewable Energy Solutions in the MENA Region: A Driver of Local Value and Job Creation"

1 Overview

Title	Regional Conference on "Decentralized Renewable Energy Solutions in
	the MENA Region
Date	22 May 2017
Participants	- Decision and policy makers,
	- Public and private sector representatives,
	- Experts and researchers from RE and EE training sectors,
	- Representatives from regional and international institutions
Organizers	GIZ, RCREEE and LAS
Venue	Hotel Intercontinental Semiramis, Cairo

2 Background

Energy security presents a major challenge for many Arab countries and is considered an indispensable requirement for inclusive, equitable, and sustainable term development. This includes first and foremost reliable and affordable access to modern energy services for the largest possible number of citizens, the lack of which can have – and in fact has had – profound negative impacts on the living conditions and working conditions of the latter.

Access to electricity is particularly challenging due to the weakness of power systems in many countries. Decentralized Renewable Energy (DRE) technologies in particular offer viable, cost-attractive and easy-to-implement solutions to meet the needs and wishes of residential and productive sectors, such as agriculture, tourism, and industry.

DRE technologies possess several key advantages: provided the right frameworks and incentives are in place, they allow for the rapid deployment of large new generation capacities (not just for electricity, but also for heating and cooling), including in difficult or remote areas, with an over-proportional creation of new local employment and a potentially large(r) implication of local populations in the value chain. This applies to small-scale PV (on- or off-grid), including for solar pumping and as fuel savers, solar heating and cooling, wind power,



modern biomass for electricity and heat generation, as well as to a wide array of energy efficiency applications in the various concerned sectors.

However, they also involve several major challenges: people need to become aware and convinced of the opportunities they have, they have to be ready to invest and produce, and they need be able to deliver at the right time, in sufficient quantity and with the necessary quality. DRE technologies therefore require a quality infrastructure in place (and effect) *before or at least once the roll-out is started*. People need to be prepared and trained in order to have the necessary competences and capabilities, and quality criteria and control mechanisms need be set up in order to oversee and if necessary enforce this. The more people are involved in this process, the more imperative this becomes.

The promotion of decentralized renewable energy applications in the MENA region is therefore at the heart of the cooperation between the GIZ Project RE-ACTIVATE (Promoting employment through renewable energy and energy efficiency in the Middle East and North Africa) and the Regional Center for Renewable Energy and Energy Efficiency (RCREEE).

In order to allow for a targeted exchange among relevant stakeholders on both the energyspecific and the socio-economic potentials and opportunities of DRE.RE-ACTIVATE, the League of Arab States (LAS) and RCREEE are organizing a regional event titled "Decentralized Renewable Energy Solutions in the MENA Region: A Driver of Local Value and Job Creation" on the 22nd of May a back-to-back with the Arab EE Day of LAS on the 21st of May.

3 Objectives

- Present which of the DRE applications are currently at the forefront of technological and industrial development, and how they have been able (or likely) to contribute to energy security and socio-economic development in key developing and emerging countries worldwide
- Highlight emerging market needs and potentials for DRE solutions in the Arab Region
- Explore which gaps and challenges need to be overcome in this regard
- Explore international and regional benchmarks and best practices
- Provide knowledge on the results of the studies conducted on a regional level to assess the applicability and the importance of the DRE solutions
- Share experiences and stimulate dialogues on appropriate solutions that can maximize the socio-economic benefits of DRE solutions in the Arab Region

4 Conference content

4.1 Introductory words from GIZ, LAS, Ministry of Electricity and Renewable Energy and RCREEE

The regional event was opened by Dr. Steffen Erdle (GIZ), giving the first, second and third welcoming speech to Dr. Maged Mahmoud (RCREEE), Eng. Khaled Hosni (LAS) and Dr. Ahmed Mehena (Ministry of Electricity and Renewable Energy). They highlighted the DRE technologies (advantages, challenges) and the impacts of Decentralized Renewable Energy on value chain and job creation.

Dr. Steffen Erdle and Dr. Maged Mahmoud highlighted the cooperation between the GIZ Project RE-ACTIVATE (Promoting employment through renewable energy and energy efficiency in the Middle East and North Africa) and the Regional Center for Renewable Energy and Energy Efficiency (RCREEE).

Dr. Ahmed Mehena highlighted the fact that the regional cooperation to achieve sustainable development in the MENA region

After the Opening speeches Dr.Steffen Erdle(GIZ/RE-Activate) gave an overview presentation on one concept in decentralized renewable energy mean, what the benefits that can be derived from it, what the challenges that associated with it and what be could mean for future working practices.

Dr. Ulrike Lehr (GWS) gave a brief introduction to the DRE application and she highlighted that they are doing a study currently on socio-economic benefit of renewable energy and energy efficiency, and their study has been committed by RCREEE.

Dr. Ulrike Lehr highlighted that they are analyzing the jobs effects and how many jobs in renewable energy in Egypt today and in future.

4.2 Session 1: Moderated by Maged Mahmoud (RCREEE)

Dr. Maged Mahmoud gave a brief introduction about the session. The session is about sharing the experience of five Arabic country (Jordan, Lebanon, Tunisia, Mauritania, and Sudan represented by Ms. Dianna Athammneh, Ms. Sorina Mourtada, Mr. Ali Ben Abdullah, Mr. Cheikh Hamoud, and Mr. Yasser Abdullah, respectively) in the field of renewable energy with the title "Starting small, growing fast – DRE as a catalyst for RE development" followed by discussion. Dr. Maged highlighted that, in the Arab region, Jordan is number one in the regulatory framework, based on assessment in the Arab future energy index, Morocco is



number one in market competitiveness, and Egypt as of May 22,2017, is number one in the institutional development.

4.2.1 Jordan

Ms. Dianna, in her presentation, provided an overview of RE's development in Jordan. In term of legislative and regulatory platform, Jordan issued RE and EE law in 2012. Based on this law, several regulation and project was established such bylaws issued by cabinet 2013-2015 (tax exemption, direct proposal and Jordan RE and EE Fund (JREEEF)). In addition, Energy, and Minerals Regulatory Commission (EMRC) issued regulation regarding reference price list, net metering, and wheeling). And for direct proposal, two rounds have already been accomplished and bidding process for the third round is in its final process, which is to produce 200 MW solar and 100MW wind. Jordan has developed 733MW solar and 513Mw wind (divided between completed and operational, completed and not yet operational, and in the execution phase).

She explained the role of JREEEF in Jordan sustainable development and its supporting mechanisms. JREEEF aims to reduce the energy cost, scale-up RE and EE investment, secure funding, and ensure access to affordable, reliable, sustainable and modern energy for all. It provides a wide range of services such as resolving credit, grants, equity financing, guarantees, and technical assistance. Its programs include school heating program (EE - insulation, HVAC, lighting, SWHs, etc – and RE - PV), household (SWHs, PV, LED lamps, and off-grid systems), government building (Energy audit's funding), worship places (25 -50 % grant for PV installation), SMEs (industrial, hotels, and commercial through 100% energy audit funds, partial funding (25%) for RE and EE implementation in hotels, and bank loan), awareness and capacity building (public campaign, social media presence, and training) , and innovation (up to \$14400 grants to support RE and EE activities). Jordan plans to have 200,000 solar water heaters, 100,000 time 2kWp solar PV system 1 million LED lamps distributed by 2020.

4.2.2 Lebanon

Dr. Sorina Mortada represented the Lebanon case with EE and RE with focus on decentralized RE. she said that, the booming in the RE and EE is due to the availability of policies regulating them such as policy paper for electric sector 2010, National Energy Efficiency Action Plan (NEEAP 2011-2015 and NEEAP 2016-2020), and National Renewable Action Plan (NREAP 2016-2020). RE exists since 2000s however, it only gains its momentums in 2013 with the introduction of NEEREA mechanism. Lebanon has installed 2MW solar PV. In addition, 200MW wind farm is to be installed soon under PPA. Also, the tender document of 12 PV solar farms



of 120-180MW solar PV will be released mid-May (under PPA) and many more public bids are being prepared.

Dr. Mortada elaborated more on the NEEREA financing mechanism – initiatives 11: Financial mechanisms and incentives. "This initiative aims to provide proper financing mechanism in order to promote the use of energy efficiency and renewable energy. This is mainly linked to the collaborative work with the Ministry of Finance and the Central Bank of Lebanon". This financial mechanism allows the end users to take a loan for 14-year with 4-year grace with an interest rate of around 1.075%.

As of 2017, Lebanon has a cumulative PV capacity of 19,501 kWp in the sectors of agriculture, commercial, industrial, non-profit, and residential. There are 445 PV projects covering residential, commercial, industrial, agriculture and non-profit with share of 71, 18, 6, 3, and 2 percent, respectively installed under NEERA mechanism. PV projects is distributed per technology by 34 % hybrid, 7 % solar pumping, 18 % off grid, and 18% on grid and are expected to grow yearly by 10%, 35%, 14% off grid and 26% on grid, respectively.

NEEREA financial mechanisms also supports the solar water heater with loan with 1% interest rate for system cost more than \$5000, 0% for system less than \$5000, and provide \$200 grant for systems that are qualified by LCEC.

Some of the advantages of RE and EE are reduction of energy cost for the end-user, creating more than 10000 direct and indirect jobs, increasing the number of companies working in SWH from 25 in 2010 to 170 as of 2017, and increasing the number of companies working in Solar PV from 5 in 2010 to more than 70 in 2017. Thus, sustainable energy has boosted the Lebanon market.

4.2.3 Tunisia

Mr. Ali Bin Abdallah presented the development of RE and EE in Tunisia in term of policy and regulations, orientation and strategy, local markets and impacts, and drivers, obstacles, and opportunities. The law related to RE is law number 12-2015 which about the production of electricity from RE. Then the decree implementing the law no 2016-1123 of August 24, 2016 - state the condition and procedure for carrying out projects for the production and sale of electricity from renewable energy sources. Then comes the decree of Decree of 6 December 2016 on the Establishment of the CTER which is followed by the Decrees of February 9, 2017 relating to technical specifications for connection to the network, Contracts for the purchase of surplus for auto production and the purchase contract for the total sale to STEG governed by the authorization scheme (PPA). and the latest is the Order of 22 March 2017 on the



Establishment of the Specialized Authority for the Examination of Problems Relating to Projects for the Production of Electricity from Renewable Energies.

Tunisia set to achieve 30% of electricity from REs by 2030. That is by installing 281 MW in 2016, 1281MW by 2020, 2531MW by 2025, and 3815MW by 2030. targets to achieve 430MW of wind and 600MW Solar PV from 2017 to 2020. The 3815MW will be achieved from auto-production, public-private partnership, public and private sector. For example, through residential rooftop PV instillation, industry MV and HV PV installation, local electricity producer from RE, international investor, and La STEG public investment.

Local market for the PV has been very promising in Tunisia and showed a constant increment in investment from 2022 mDT in 2010 to 46766 in 2016. Moreover, RE and EE created 3044 direct job and 975 indirect job in the period from 2010 to 2015.

4.2.4 Mauritania

Mr. Cheikh Hamoud presented an overview of energy sector in Mauritania including the main stakeholders, and RE and its projects. He highlighted that Mauritanian has poor access to electricity 38% in urban areas and 5% in rural areas. In recent years, focus has been on the improvement of energy sector. Thus, several electricity production stations have been constructed and the total electricity produced is 827 kW.H. These amount is generated from a mix of energy source (70% fuel, 15% hydro, 13% wind, 2% Solar PV).

The major energy stakeholders are department of electricity and energy control (Ministry of Petroleum, Energy and Mines), Mauritanian electric company, rural electricity development agency, and regulatory authority.

Mauritania has suitable solar radiation and wind speed condition for investment in the RE. The wind speed reaches 8.3 to 9 m/s in the northern coastal line. The lowest measured speed was 7 m/s. The functioning wind projects are Nouakchott wind power plant funded by the Arab Fund for Economic Development. Its capacity is 31.5 megawatts and produces 114 MW.h/year. Another wind power plant is the Mauritanian industrial and mins company project with capacity of 4.4 MW. In the other hand, solar radiation can reach to 1900 and 2400 kW.h/m².year. The main solar energy plants are Shikh Zaid with capacity of 15 MW and produces 21 GW.h, solar power plant for rural electrification with capacity of 380 kW and several small scales solar system for lightening. There are several solar power projects in the execution and planning phase. Overall, the total electricity produced from solar energy plants is 380kW which produce 832MW.h which result in reducing CO2 emission. This comes in the quest of the Mauritanian government to reduce the reliance on thermal energy, reduce the



electricity burden for the population, and meet the growing demand for it. The RE sector has created about 700 jobs in Mauritania.

4.2.5 Sudan

Mr. Yaser Abdullah from the ministry of water and electricity deliver presentation about RE status in Sudan with more focus of solar pumps for irrigation. Sudan started by assessing RE's sources and potential. The assessment was followed by setting up plans and target (short and long term). The target is to increase the RE (not including hydro) share by 15% by 2031. The generated electricity from hydro power is about 55% of total electricity in Sudan. The electricity coverage in Sudan is only about 40% due to scattered location of community.

Sudan is cooperating with RCREEE to produce Sudan National RE action plan which is to be published in July 2017. This plan includes several applications of RE (Wind and Solar). For the solar, as an example of the focus of the government on it, President Al Bashir launched an initiative called "Sudan sun: Energy and development". This initiative has several chapters, such as PV generation, solar pumping, rooftop, rural household solar electrification.

For the rooftop, the government plans to install them in big government building within 5year time frame, around 50MW of solar PV system.

The rural electrification has been implemented already in some areas of the country by providing loan for 5-year. The payment of these loan is more than 97%. The second phase is installing 10000 solar system and its planned to reach 1 million solar system by 2031. The financial support (loans) is provided by local private commercial banks whereas the ministry of water and electricity guarantee payment.

For Solar pumping sectors, under global solar facility, UNDP supports solar pumping project. Currently the project aims to install 1500 solar pumping system. 28 solar pumps have been installed as first stage (pilot) to convince the beneficiary with its technical and economic feasibility and to convince investor as well. Nowadays, Sudan is conducting another feasibility studies for solar pumping in other areas of the country.

4.2.6 Discussion round for session 1

4.2.6.1 Question from Eng. Essam Saleem

Unlike Lebanon, Jordan, and Morocco, Egypt does not have incentives for RE and EE? How can we boost the transformation to them in such case?

No Answer

4.2.6.2 Question from Dr. Jamal AbdulAfar (Head of Technical office of consumer protection Agency (CPA)

Is there any documentation and gathering done for all the expertise and experience in the Arab region for sharing through a certain platform?

Answer by Dr. Maged Mahmoud: Yes. The Regional center for RE and EE is the intergovernmental organization that aims to enable and increase the adoption of renewable energy and energy efficiency practices in the Arab region.

4.2.6.3 Question from Participants for Eng. Yasser Abdullah from Sudan

How did you encourage/ convince farmer to switch to solar pumping system?

Answer by Eng. Yasser Abdullah: by demonstration of 28 pilot solar pumps is selected farms so that farmers can see its workability and possibility. Also by providing them with loans and the government pay the cost of the solar pump and installation (Loan) and the beneficiary pay the loan back after 1 years of trying the system.

4.2.6.4 Questions from Ms. Manal Amer

1. Requested more detail about NEEREA's loan mechanisms and its interest rate.

Answer by Dr. Maged Mahmoud: there is publication for RCREEE explaining this matter in detail. It can be found on the RCREEE website.

2. Does the solar pumping system needs in Sudan needs battery to do irrigation at night? With batteries, the system will be expensive for farmer. When is the irrigation is done day or night?

Answer by Eng. Yasser Abdullah: Irrigation is better at night; however, the cost will be more. Thus, in this project in Sudan, we do irrigation during day and had to provide a bigger pump. This is more economic than having a battery.

4.3 Second Session: From niche to mainstream – PV markets in the Arab region

The session was moderated by Dieter Uh, GFA

4.3.1 PV: increasing resilience in times of crisis

Ashish Khanna presented Restoring and Expanding Energy Access in fragile and conflict countries through Decentralized solar solutions.

He spoke about reengagement in some of fragile and conflict countries in the energy sector and the Decentralized solar energy has to be a very critical part of it.



What happened in Yemen?

He sheared Yemen as a case study where access to electricity has precipitously declined since the outbreak of the conflict, from an already very low level and how conflict cases really need a reliable decentralized solar energy.

He highlighted that the access of energy in Yemen is very low before the conflicts and why decentralized solar energy is very important.

He highlighted the fact that while public supply collapsed, a sprawling supply chain for solar has emerged to fill the gap, one of the few bright stories in today's Yemen.

For completely radical rethink of what energy security in fragile and conflict countries need, they want decentralized solutions and that's the reason for a lot of conflict, also the solar prices have come down and the private sector and jobs is the best angle that really is needed in fragile and conflict countries.

They are looking at the strategy that Yemen for a long time needs the huge scale up for decentralized solar solutions.

4.3.2 Socio-economic impact study: value creation through small-scale PV in Morocco

Christoph Urbschat presented value creation through small-scale PV in Morocco and he highlighted Estimation of job creation and other socio-economic effects.

He spoke about jobs in the PV value chain where the vast majority of direct and indirect jobs will be created in the downstream part of the industrial value chain and other socio-economic effects.

He highlighted the facts that Market barriers play a very important role in the growth of the PV market and therefore have a significant effect on the creation of jobs and the added value of the economy and in the long run, more than 11,000 local jobs could be created by the low voltage PV segment.

4.3.3 Perspectives and challenges for roof-top PV development in the Arab region

Eng. Wael El-Nashar presented Decentralized Renewable Energy Solutions in the MENA Region and he spoke about the Decentralized Renewable Energy application in Egypt, for instance Bedouins Settlement Project, Health Care Units and Solar Traffic Lights project in Alexandria and Ismailia Highways.



He highlighted the differences between on-grid and off-grid applications and the impact of deploying off-grid and on-grid systems

4.3.4 Perspectives and challenges of PV manufacturing in the Arab region Presented by Magdy Zain

4.4 Third Session: Promising but challenging - Solar heating markets in the Arab region moderated by Ulrike Lehr, GWS.

4.4.1 Role of Egypt National Cleaner Production Centre (ENCPC) in Promotion of Industrial Application of Renewable Energy in Egyptian Industry by Ali Abu Sennah, ENCPC

Dr. Ali Abu Sennah provided an introduction about Egypt National Cleaner Production Center including its mission vision and structure. He then explained the services provides by the center which can be summarized as Technical assistance for the Egyptian industry, Industrial Waste Management, Recycling and Zero Waste, Financial Assistance, Applied Training Programs, and Joint National and International Projects.

He then provided an overview of about 15 projects that the center was involved with as a partner with other organizations mostly UNDP. Some of the center objectives are Promoting of Local Manufacturing of Renewable Energy Technologies for industrial application in process heating, Reduction the use of conventional energy sources in the industrial sectors especially: Food, Chemical and Textile, Creation of jobs & promotion of entrepreneurship for application of renewable energy technologies in industrial sector, and Reduction of GHGs and its environmental impact. These objectives are achieved through the project components – policy, technical, capacity building and awareness raising, and financial and demonstration.

Following through these objectives and their components, the expected result of could be summarized in the following: design of incentive schemes & policies, demonstration of pilot projects, Capacity building, development of standard specifications for manufacturing, installation & operation of solar thermal technologies for industrial sector, design innovative financing package.

4.4.2 Implementation Requirements for a certification Program at national Level by Ashraf Kraidy (RCREEE)

Eng. Kraidy in his presentation provided an overview about the project SHAMCI Certification scheme. It is first Arab quality certification scheme for the solar thermal products and services in the Arab region. It provides a regional industrial and regulatory compliance framework for



policy makers, industrial sector, and end-consumers. It also promotes adopting standard quality measures, accreditation systems and quality labels across the Arab region. And it is built around specific characteristics and needs of Arab states in the Middle East and North Africa.

4.4.3 Discussion of Session 3:

Remark by Mr. Ahmed Zakur (From rationalization department KSA) If SHAMSI is not mandatory, it won't be effective. Thus, I suggest that it to be made mandatory in the Arab region.

Question from Mr. Ahmed Zakur (From rationalization department KSA) - For SHAMCI, Has the private sector being involved and considered SHAMSI and labeling etc as they are the one who will bring the product at the end?

Answer: By Mr. Ashraf Kraidy: No, we are not active in communicating with manufacture because we are a regional organization. We deliver the knowledge to the certification body at each country and their mission to communicate it to their manufacture.

- Do you think applying these certifications will have any financial implication on the product?

Answer: By Ashraf Kraidy: Yes, but It's not necessary coming up because in some cases you need to consume some effort in the redesigning process and when you go for mass production you can see that the cost is the same.

- What is the incentives for the manufacture that will drive them to certify them product?

Answer: by Ashraf Kraidy. Getting bigger market.

Remark: Improving the standard means increasing the cost of production. As you want to promote the technology, the prices should stay rescannable, subsidies in the energy sector is needed to promote the technology and offer profit for investor.

- Why isn't it possible just to transfer the solar key mark from Europe to here? What are the difference between this one and the European one in term of technical aspect etc?

Answer: it was planned to adopt the solar keymark however, in the deep details of the solar keymark, it was found that we are the same in term of technical specification as the same standard is used. However, the problem lies at the administration procedure. In Europe, it is very organized and all the steps are accredited with 17 or 25. In contrast there is no accredited



testing facility in the whole Arab region. The accreditation process itself take 5-year. And in Europe you can find a professional certification body unlike here. It will be very costly to certify a product imported from china to the region where it will require someone from Europe to travel to china to certify it. Thus, it's very expensive to be adopted as it is. `

4.5 Fourth Session: Classical yet underserved – Off-grid markets in the Arab region

The session was moderated by Hammou Laamrani (GIZ)

4.5.1 Hybrid solar applications in the Egyptian hotel sector

Ms. Rana El-Guindy presented hybrid solar applications, especially in the hotel sector and she highlighted the fact that the solar cooling, heating and the facility that are in hotels it is really have a facing in the energy security problem. That's why most of the hotels in the MENA region are located in remote areas that are off-grid; they usually go to the decentralized renewable energy technologies.

However, these technologies are known to be highly cost effective and have large operating cost and because of the renewable energy in the region they are becoming very unreliable in the MENA region, that's why, they should be replaced by solar hybrid system because it secures the stabilization of the energy expenses in the tourism hotels in remote areas and for the investors because it secures the independence from unreliable grid connection.

She gave a brief introduction to the manual guideline offer and she explained why did they choose Egypt as pilot area?

What does the manual guideline offer?

It discusses the opportunities for solar PV and solar thermal applications in the MENA region, it supports the decision-making process for a solar PV hybrid system to support the investor to choose the most cost-effective solutions and it gives a special focus on Egypt as a pilot area in the MENA region

Why did we choose Egypt as a pilot area?

Because we work in Egypt on RE-ACTIVATE project at national activities and because it has one of the largest potential, and also tourism sector is contributing to 15% of Egypt GDP and finally, because it is one of the RE-ACTIVATE projects that support the cooperation between the MENA and Germany

4.5.2 A tentative assessment of the Egyptian solar pumping market

Ms. Inass Abo Khodeir presented an assessment of the solar pumping market in Egypt and she gave an introduction to the main goal of RE-ACTIVATE and she highlighted the status quo of agriculture sector and water sources in Egypt and also a breakdown of agriculture landholdings.

After that Ms. Inass shared a preliminary result that they have from ongoing study assessment of the solar pumping market in Egypt because this topic is very important not only for solar pumping or levelization of solar solution, but also because it contribute to the Water-Food-Energy nexus which is attracting many attentions now look on national regional and international level.

4.5.3 Introduction of PV-diesel hybrid solutions in off-grid agriculture and tourism in Egypt

Roman Brinzanik gave introducing word about KRAFTWERK Company as a private company and he highlighted the development partnership that they are going to build in the summer together with GIZ and the German ministry for economic cooperation.

Who is KRAFTWERK?

We are German PV project developer, we offer solutions for solar parks, and for industrial commercial and we offer off-grid solutions.

Roman Brinzanik also presented PV-diesel hybrid solutions in off-grid agriculture and tourism in Egypt. First about the PV diesel hybrid system;

How is it working? What kind of technology is this?

The main idea is very simple when produce electricity with diesel generator what you can do is to inject into the diesel grid PV electricity and the main idea is that at least in many countries solar energy is cheaper than diesel if the diesel not subsidized so the electricity from solar PV is much cheaper in a kWh.

4.5.4 Discussion on Session 4:

4.5.4.1 Question by Dr. Steffen Erdle regarding solar pumping market in Morocco.

Last time we were in morocco we saw installed solar pumping system everywhere. Where we just lucky? Did we just pump into areas where they are deployed or is there maybe despite of problematic public framework, isn't there market take off? There is actually a market that



is emerging involving completely outside publicly regulated framework with all the problem this bring with it.

No Clear Answer