NON-RESIDENT NEPALI ASSOCIATION

C1T4 Ujyalo Nepal

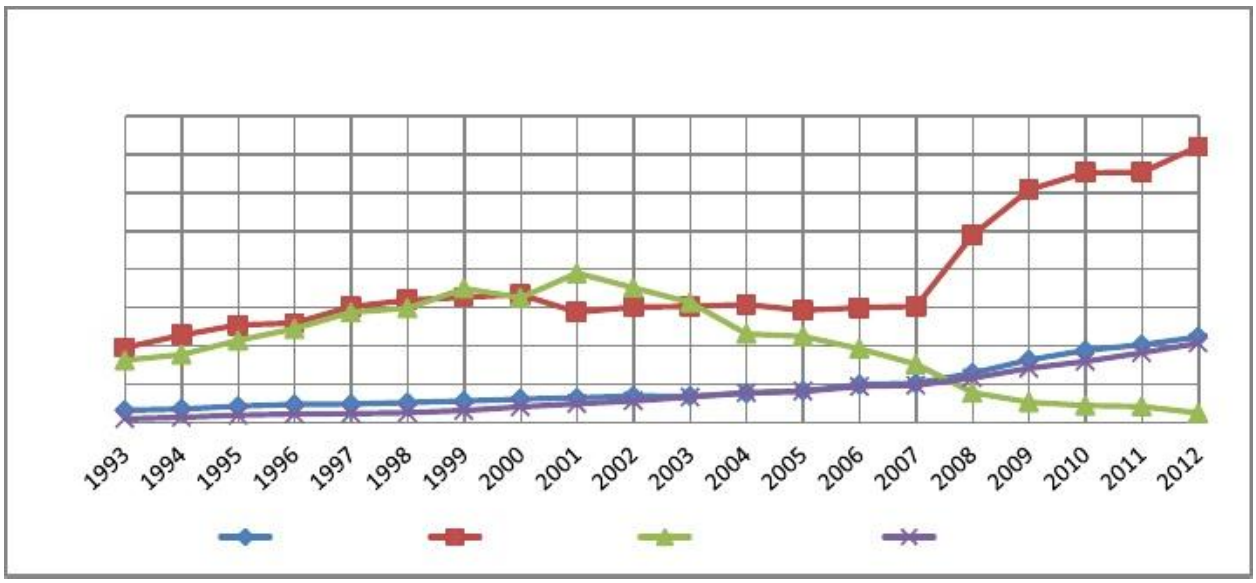
Terms of Reference

1.Background:

Development of country largely depends on energy source available along with other factors. Energy play very crucial role in socio economic development of country in micro and macro level. Every sector of country like manufacturing industry, transport, and social needs energy in different form to continue its running. Different forms of energy used in Nepal are Diesel, Petrol, Kerosene, LPG, Electricity, fire wood, Coal, Bio-mass etc. Nepal being landlocked country and deprived of economic viable fossil fuel sources mostly depends on locally available energy source. The need of fossil fuel is fulfilled completely by import which is increasing alarmingly. It became the integral part of Nepalese life to face long hours of load shedding, never ending queue in front of petroleum dealers, LP gas dealers etc. There is no sign of relief for ongoing for energy crisis in recent year which is acting as barrier for the progress of country. The economy of Nepal is declining everyday due to many factors mainly political instability, corruption, energy crisis, trade deficit etc. The lack of energy is one of the major binding constraints to economic activities in Nepal. Nepal macro economics is suffering heavily due to this energy crisis. For higher growth rate, enough power for households, enterprises and industries is a must. The energy crisis or simply electricity crisis in Nepal begins from year 2006 AD when the hydro power project ceased to come after Khimti and Bhote Koshi Hydro Power Project in year 2005AD. Given the rapidly increasing population and burgeoning urbanization, electrical energy demand will continue to see a steep upward trend while supply will continue to fail in meeting demand. It can therefore safely be predicted that the numbers of hours of load shedding will be longer and painfully prevalent in the short to medium term. The country GDP fails to cross even 5% mark due to low internal production, less industrial productivity etc. Nepal's manufacturing sector, third largest contributor to the country's gross domestic product (GDP), has been forced to operate far below its total capacity for the last three years, according to Nepal Rastra Bank (NRB). Presently the capacity utilization of manufacturing industry is 57.86%

There are mainly three factors, Energy Crisis, Labour Union Issue and Political Instability due which our industry are working under capacity.

The impact of energy crisis in Nepal can be interpreted from different sector and perspective. The fuel import data from Nepal Oil Corporation shows the level on increase in diesel import. The graph shows that, the import of Diesel increases exponentially from year 2007-2008 AD which was prime year for load shedding by Nepal Electricity Authority. The graph presented below shows the trend of fuel import in Nepal.



The value of diesel imported, increase by more than 300% in last 5 year which is major reason behind huge trade deficit in Nepal. The graph below show the trend of money outflow used only for diesel import. The majority of diesel import increase due to increase demand in industrial sector, office, residential and other location for power generation. Industrial sector consume about 60% of imported diesel.

Another impact of energy crisis is declining output of manufacturing industrial sector. It is the hardest hit sector due to energy crisis due to which they are forced to run 40% below their installed capacity. The comparative chart [4] of total GDP and GDP of manufacturing sector shows the decline of GDP in manufacturing sector. The region behind the low GDP of manufacturing industry is energy crisis.

Similarly, billions of money is used to import the alternate solution for energy crisis which has huge impact on national GDP of Nepal and big contributor in trade deficit. The major import items are Diesel Generator, Parts and Lube for DG, Lead Acid Battery, Inverter etc. The import of Inverter and its component like Battery, parts etc is increasing alarmingly and its waste of billions of rupee directly and indirectly. The efficiency of inverter is merely 50-60% which is another cause of loss of grid power.

The trend line of Inverter and battery component shows alarming situation which might even impact the grid power distribution.

The annual peak power demand of the Integrated Nepal Power System (INPS) in fiscal year 2011/12 is estimated to be 1,026.65 MW, with 448 MW power estimated to have been shed. Out of the 578.65 MW of power actually supplied, 349.71 MW was contributed by NEA hydro, 5.3 MW by NEA thermal, 102.2 MW by IPP hydro and the rest 121.44 MW was import. Compared to the preceding fiscal year's figure of 946.1 MW, the annual peak power demand of the INPS registered a growth rate of 8.5 %. We have more than 14 hours of power cut during dry (winter) season. Though the practical potential of hydro power generation in Nepal is more than 40,000 MW, Per capita electricity consumption of Nepalese is 93 units, far below the per capita electricity consumption of Asia which stands at 806 units. India´s per capita electricity consumption stands at 644 units compared to 2,942 units of China. Per capita electricity consumption of Bangladesh, Sri Lanka and Pakistan stands at 279, 445 and 457 units, respectively.

Energy is the backbone of an economy. Its availability and consumption reflects the level of development of a nation. The catalytic role it plays in advancing traditional economy towards modernization has escalated its demand. It is a vital input in the process of socio-economic prospects of a nation.

The higher the availability of energy, higher is the level of development and vice versa. Whenever there is debate about energy crisis, we think about hydropower in first place. In one place it is

right to discuss about. The hydropower potential of Nepal's river systems is about 83,000 MW, out of which only 25 percent is potentially available for development (WECS 1994; WECS 1996). Hydropower utilization is currently less than one per cent of the proven potential. The total installed hydroelectric generation capacity is 652 MW (NEA). Just 40% of the population is connected to the main grid. Electricity only account for 2% in energy sharing where as petroleum products account for 9%. The use of petroleum product dependency can be decreased significantly if the electricity is readily available in cheaper price. In other hand this will also help in reduction of green house gas produced due to burning fuel. Energy is an important input in production process in an economy power shortage has bound industries to cut down production heavily if not shut sown factories both service and goods reduction industries of small to larger scale have been struggling to exist. There has been threat of shrinking job opportunities and even job cuts. Education and health sector too are facing difficult time. Students are forced to use other form of light like candle, kerosene lamp, LED lights powered by rechargeable battery etc for study. This is indirect impact of power crisis while use of low light for vision is directly affecting in health of children and adults. The economic impact of deteriorating health due to low light is yet to be calculated. Tourism industry too hit hardly from energy crisis. Candle light dinner once in a fort night is fun but not daily. Presently tourism industry is facing big crisis due to back nights. Tourism industry cannot thrive in darkness of country. It needs to be light on to make Nepal visible in the eyes of world. The loss to tourism due to power crisis too is in billions of rupees as well as it has long term negative impact in this industry. Agriculture industry fails to takeoff due to many reasons and power crisis is one of the factors. Industry for agriculture inputs, new industry for processing of agriculture output etc cannot be established. In absence of these industries, the main income source of domestic income is declining year on year. By term energy, it is understood hydropower in Nepal. It has dominance coverage in urban household and industrial utility and even the most versatile and eco-friendly nature is the backing factors. The potential alternative sources are not developed at satisfactory level yet manage their existence at rural settings. Integrated energy policy (IEP) is an issue in the situation such as envisaged in power sector now-a-days. The simultaneous development of all possible alternative sources of energy is required to meet the present demand and estimated development of the sources needs to be clearly marked beforehand to guide power development in Nepal.

1.1 Conclusion:

The economic accountability due to energy crisis is huge in respect to other factors like political instability, funding, skill manpower etc. The lack of energy is one of the major binding constraints to economic activities in Nepal. For higher growth rate, enough power for households, enterprises and industries is a must. There must be effort from all direction to solve the energy crisis and development of hydropower as well as integrated use of hydro resource. The proper plan and policy, long term vision and concrete foundation are required to first mitigate and then eradicate power problem. Country can only move ahead with adequate energy supply. Mini-hydropower, solar and some wind power could potentially play a very significant role in Nepal’s energy mix in the years to come. Though hydropower will still be the dominant energy source, solar and wind have a huge prospect to substantiate the economy. Incentivizing these powers with appropriate national policies and renewable development strategy could be very helpful to encourage new power industry in the country. The success of a growing renewable industry is contingent to the effort and support of the government. And, once in place, the diversification of energy mix can fuel the rural and semi urban areas. The sustainable increase in GDP can be achieved by making long term strategy for increase in internal production which depends on adequate energy supply.

In one hand there is such a acute Energy Crisis in country, in other hand we have huge Energy loss. The traditional lamp which we are using in most places of the country consumes many times energy more than LED lamps.

1.2 LED lights:

The light-emitting diode (LED) is one of today's most energy-efficient and rapidly-developing lighting technologies. Quality LED light bulbs last longer, are more durable, and offer comparable or better light quality than other types of lighting.

1.3 Energy Savings

LED is a highly energy efficient lighting technology, and has the potential to fundamentally change the future of lighting. Residential LEDs use at least 75% less energy, and last 25 times longer, than incandescent lighting.

Widespread use of LED lighting has the greatest potential impact on energy savings in Nepal.

If we can change 10 million of traditional lamps of 40W to LED lamp of 9W, which has similar lighting effect, we can economy 10 000 000 X 30= 300 MW electro energy as on today.

The Economical benefits of LED lights are clear and apparent.

1.4 How LEDs are Different

LED lighting is very different from other lighting sources such as incandescent bulbs and CFLs. Key differences include the following:

- **Light Source:** LEDs are the size of a fleck of pepper, and a mix of red, green, and blue LEDs is typically used to make white light.
- **Direction:** LEDs emit light in a specific direction, reducing the need for reflectors and diffusers that can trap light. This feature makes LEDs more efficient for many uses such as recessed downlights and task lighting. With other types of lighting, the light must be reflected to the desired direction and more than half of the light may never leave the fixture.
- **Heat:** LEDs emit very little heat. In comparison, incandescent bulbs release 90% of their energy as heat and CFLs release about 80% of their energy as heat.

1.5 LED Products

LED lighting is currently available in a wide variety of home and industrial products, and the list is growing every year. The rapid development of LED technology leads to more products and improved manufacturing efficiency, which also results in lower prices. Below are some of the most common types of LED products.

1.6 Industrial and Commercial Lighting

The high efficiency and directional nature of LEDs makes them ideal for many industrial uses. LEDs are increasingly common in street lights, parking garage lighting, walkway and other outdoor area lighting, refrigerated case lighting, modular lighting, and task lighting.

Kitchen Under-Cabinet Lighting

Because LEDs are small and directional, they are ideal for lighting countertops for cooking and reading recipes. The color can appear more cool or blue than is typically desirable in a kitchen, and there can be some excessive shadowing in some fixtures, so it is important to compare products to find the best fixture for your space.

1.7 Recessed Downlights

Recessed downlights are commonly used in residential kitchens, hallways, and bathrooms, and in a number of office and commercial settings.

1.8 LED Replacement Bulbs

With performance improvements and dropping prices, LED lamps can replace 40, 60, and even 75 Watt incandescent bulbs. It's important to read the Lighting Facts Label to make sure the product is the right brightness and color for the intended location. When chosen carefully, LED replacement products can be an excellent option.

Advantages of LED:

- **Safer**: LEDs are much cooler than incandescent lights, reducing the risk of combustion or burnt fingers.
- **Sturdier**: LEDs are made with epoxy lenses, not glass, and are much more resistant to breakage.
- **Longer lasting**: The same LED string could still be in use 40 holiday seasons from now.
- **Easier to install**: Up to 25 strings of LEDs can be connected end-to-end without overloading a wall socket.

NRNA in the Tenure had started the campaign UJYALO NEPAL where we are going to change 10 million of traditional lamps to LED lamps, hence economizing 300 MW electro energy.

1.9 **HOW WE ACHIEVE IT:**
By the end of January 2018, we will establish a sub committee under NRNA ICC under the Convenorship of GS of NRNA Dr. Badri K.C.
The team will work to import or to establish a local production of LED lamp. NRNA itself will not be involved in business sector, so an individual entity with the involvement of NRNs will be established.
The Entity will be solely owned by NRNA and the profit from the entity will be used only in the social economical projects.
The team will work to involve NRNS living abroad to motivate their families living in Nepal to change the bulbs. Individual NRNS will buy the LED lamps and change the bulbs in their houses/villages/ cities etc.
We urge individuals to donate lamps to their villages or some houses. We will use local youth and woman organization for the agitation and motivation.
The team has already preliminary negotiation with NEA for the cooperation in the energy field.

2) Term
This Term of Reference holds good from October 2075 to October 2019.

3) Aims and objectives
To change 10 000 000 traditional lamps to LED lamps during the tenure 2017-19.
4) Composition of Membership

The advisors and members table is attached separately.

5) Meetings

Meetings will be held at the discretion of various teams, following consultation with the Chair.

Implementation Mechanism

(1) UJYALO NEPAL: this will be the apex body with NRNA representatives and distinguished professionals from around the globe, which will guide the project.

Reporting Relationships

The UJYALO NEPAL reports to the ICC every three months.

(4) Project Management Office/ Secretariat: The whole project will be managed by a full time paid Management Team that will include;

a. A Project Manager/Management Team,
b. Administrator/ Accounting and audit firm,
c. Support staff as required.

With best regards,
Dr. Badri K.C.
General Secretary, ICC NRNA
Convener UJYALO NEAPL