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Albania: Tracing the Paths of Biomass Energy

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Abstract: Current innovative biomass energy is a better option to replace fossilized fuels to make every country self sufficient and Albania is towards it to utilize its woody and non-woody biomass with its natural resources - hilly ranges, forests, rainfall, agricultural sector, rural manpower and rivers. Another sector of feedstock that Albania can make best utilizations is agricultural, agro-industrial and animal husbandry's bio-wastes through drying, burning, pyrolysis and oxidation. Albania's estimated energy potential is 1800 toe/year for farm wastes, 2100 TJ for animal wastes and urban wastes 9.5 Mtoe by 2050. In the current paper the authors call for bio-energy generations for Albania on sustainable way with mandatory regulatory systems of reforestation, safe-guard of ecology and food sector. Albania can utilize 48% of the rural manpower out of 3.2 million through co-operative and/or big farm establishments with incentive policies from the government. There is lack of knowledge on renewable energy production as resource to increase farm income among the agrarian communities. Agricultural Institutions and

Departments of Animal Husbandry with Forestry and Engineering faculties must march hand-in-hand to tackle eco-friendly bio-energy productions by utilizing Albania's natural replenish able resources without altering the food productions but to safe-guard and strengthen.

Keyword: Woody and non-woody biomass, bio-wastes, bio-fuels.

INTRODUCTION

An array of energy crops (sugar cane, reed grass, algae, corn, wheat, sweet sorghum, cassava, soybean, Jatropa, oil seeds, bacteria, yeast etc.,) and biomass wastes (agricultural, agro-industrial, animal, biogas slurry, food processing and urban etc.,) can be utilized as feed stocks for the productions of bio-fuel energies. Works[19], [21] have shown the priorities of energy sectors especially electricity generation for the growth of Albania in lines of socio-economic development for a country typical of Mediterranean with mild, wet winters; warm, sunny rather dry summers and the highlands of typical Mediterranean continental climate welcomes alternative energy sources for sustainability. Energy priorities, security through better exploitations and energy diversification have been discussed by Albania due to rapid increase in domestic energy demands[16], [19], as it participates in the Stabilization and Association Process (SAP) since 2006 and has signed SAA (Stabilization and Association Agreement) with EU since 2009[12]. Currently Albania is an energy importer a crucial factor for the economic growth. Albania's current energy sources are hydro, coal, oil and natural gas with less tapped biomass energies. **Table-1 -** shows total primary energy products (TPEP) by resources for 2008[29]. As of now, several technologies and techniques of renewable sources of energies namely, wind, solar, geothermal, hydropower and biomass energy have been adopted to meet the required demand due to oil crisis that raised since the 1970s[13] considered as worldwide scenario. Works by[15], [21], have recognized the importance and tapping of renewable energy sources for Albanian nation a country that is Southeast part of Europe bordered with Montenegro in to the

Table-1: Albania's Total Primary Energy Products

Type of resources (2008)	ktoe	%
Hard coal	23	1.09
Oil	1324.8	62.53
Natural Gas	8	0.38
Nuclear	0	0
Wind	0	0
Solar	0	0
Fuel-wood	215	10.15
Electricity	535.8	25.3
Others	12	0.56
Total	2118.6	100

(Source: Saraci and Leskoviku, 2009)

Northwest, Kosovo to the Northeast, the Republic of Macedonia to the East and Greece to the South and Southeast having total area of 28,748 Km^2[19], [35] . Albania's on-going energy demand through sustainable bio-fuels can be outlined as: Electricity generation, Home heating purposes, fuelling for vehicles and Agro-industrial and industrial productions. Biomass utilizations for bio-fuel generation means identification and procurement of organic materials that have in store the chemical energy gained through the processes of photosynthesis[26] by tapping sunlight during their growth period as producers and at consumer levels. There is always a balance between live production biomass and dead biomass [31]. Both live and dead biomass can be usable commodities for bio-fuel generation. Live biomass procurable is in the form of woody and non-woody categories from forests, agro-industrial plantations, farms and untapped hilly areas [5], [19]. The dead biomass wastes of agricultural, agro-industrial, animal and urban garbage categories are the other sources. Bio-energy or energy produced from biomass can be used as a replacement of fossil fuel for multiple reasons. It is a sustainable renewable energy source that could fulfil most of the energy demand in future. Bio-energy options are at hand, satisfying environmental, commercial, technical, socio-economic and political requirements. Bio-energy appears to be amongst the most attractive energy that one can harness today and even in the future [30]. Any investments in line of bio-energy productions, Albania is a promising benefit due to its population which is relatively young by European standards, with a median age of 28.9 years. According to the Albanian Institute of Statistics, the estimated Albanian population in 2010 was 3,195,000 with highly educated people and the labour costs are very interesting [14].

2 IMPORTANCE OF BIOMASS AS AN ENERGY SOURCE

The production of biomass in the world is approximately 985 million tons per year. Biomass fulfils 26.23% of primary energy consumption in non-OECD countries, while it accounts for only 3.4% of primary energy consumption in OECD countries. The significance and the breakdown of biomass in energy consumption in different world regions are given in **Table-2.** Apparently biomass is the only available and affordable energy source for rural populations and poorest sections of developing countries [9]. Biomass energy sources including municipal solid wastes, forest residues and biogas from organic wastes are commonly used to generate electricity, space heating, cooling houses, fuelling vehicles etc [20]. Biomass can be converted into a usable form of energy by combustion or biochemical or thermo-chemical processes. Besides combustion for heat, biomass can be converted to gas and liquid fuels. Bio-ethanol can be produced from starch and sugar or from cellulose and lingo-cellulose biomass and used in transport vehicles with spark engines.

Bio-diesel generally is produced by trans-esterification of vegetable oils such as soybean and canola and is used in transport vehicles with compression ignition engines. Most automobile manufacturers recommend up to 10% ethanol by volume, although some experts maintain that modern gasoline vehicles can handle up to 17% ethanol by volume [25]. Biomass is one of the major future renewable energy sources considered to be alternative to conventional energy sources such as: oil, natural gas, etc. and is a native resource for Albania. The use of biomass as renewable energy in industry, heat, electricity and for the production of fuels can reduce oil-based energy sources that share total energy production because it is clean energy that could improve environment and generates low air emissions compared to fossil fuels [5]. The advantages of renewable diesel blend versus fuel produced with the FAME process are: reduction of waste and by-products, higher energy density and improved cold flow properties. The process also increases the storage of blended fuel and stability of the finished bio-fuel product. From an environmental view point, bio-diesel and renewable diesel fuels can diminish emissions of hydrocarbons, carbon monoxide and particular matter. So far diesel vehicles are 20-40% more energy efficient compares to gasoline vehicles as a result GHG emissions is reduced 10-20%. Taking into account the usage of bio-diesel and renewable diesel fuels can further enhance reduction of carbon dioxide emissions anywhere [9].

Table-2: The share of biomass in energy consumption in different world regions in 2000

Country/Region	Share of biomass in final energy consumption (%)
Africa	58.4
Asia	42.3
Bhutan	89
Cambodia	80
China	18.5
Denmark	10.3
Enlarged EU, EU 25	3.7
Finland	19.6
Germany	2.1
Laos	80
Latin America	19.57
Latvia	30.3
Nepal	86
OECD countries	3.4
The old EU countries, EU 15	3.7
Total non ECD	26.23
World	14.2

(Source: RWEDP, 2000)

3 CHARACTERIZATIONS AND TECHNOLOGIES IN GENERATION OF BIO-FUELS

Non competitive green energy sources are the current trends for the productions of bio-fuel among them forest biomass (woody and non-woody) and waste biomass can be considered but a growing environmental consciousness is a necessity to reforestation when accessing forest biomass and hygienic conditions while harnessing waste biomass. New renewable fuel standard and renewable fuels are named as motor vehicle fuels produced from plant or animal products or wastes from Environmental Protection Agency. According to this classification, two different forms of diesel fuel are specified: bio-diesel and renewable diesel. Each is classified according to the process by which it is produced. Chemically bio-diesel is fatty acid methyl ester (FAME). Bio-diesel is chemically different from petroleum diesel, has different properties and meets different quality standards [26]. However, [26] mentioned that bio-diesel can be blended with regular diesel oil up to 5% bio-diesel by volume without major problems. It is also less energy intensive than ethanol from corn because fermentation and distillation is not required. Green diesel, also known as renewable diesel is a form of diesel fuel which is derived from renewable feed stock, by using oil and animal fats but processed through other chemical processes and commonly referred to as non-esterifies renewable diesel (NERD). The most advanced of these alternatives is produced through hydro-treating, a process which is being utilized in today's petroleum refineries. During this process hydrogen replaces other atoms such as sulfur, oxygen and nitrogen and converts the oil's triglyceride molecules into paraffin hydrocarbons. Renewable and petroleum fuels could be blended at existing petroleum refineries to create a renewable diesel blend during hydro-treating process, while stand alone facilities can produce 100% renewable diesel to be used directly or to be blended with petroleum

diesel. Vast research and development in the field of bio-fuel generation technologies have been done by utilizing an array of renewable resources of live and dead biomass; however, equal importance had been laid based on the economics of the productions which vary from region to region and country to country keeping in mind the safety, limits and unfaltering the present food productions. Some of the technology options are summarized in **Table-3** and are described below. According to the form of energy requirements and biomass source and all technologies have their own advantages [6]. Combustion is the most common technology of energy production from biomass by converting solid fuels into several forms of useful energy such as: hot air, hot water, steam and electricity. Furnace that burns the biomass in a combustion turbine is the simplest combustion technology. Biomass combustion facilities that generate electricity from steam-driven turbine generators have low conversion efficiency but cogeneration can increase this efficiency to almost 85%. High quality fuels are more frequently used in small applications systems, while low quality fuels are mostly used in large-scale combustion systems. Combustion conditions have to be determined, including type of oxidant, oxidant to fuel ratio, type of combustor, emission limits, etc. The efficiency and reduction of emissions are the most important goals. Recently, the interest in wood-burning appliance for heating and cooking such as: heat-storing stoves, pellet stoves and burners, central heating furnaces, boilers etc, are growing [20].

Combustion theory for solid biomass and its principle is the same [32], with three staged process like ***drying*** all biomass with its moisture must be driven off before combustion and drying can be done by radiation (sun) or from flames or from stored heat*;* ***pyrolysis*** the dried biomass heated to 200ºC and 350ºC to release volatile gases which mix with oxygen to burn further to release further volatile gases. What remains in the end is the charcoal; ***oxidation*** at about 800 ºC the charcoal oxidizes or burns. Again oxygen is required at the fire bed and above the fire bed to combine with carbon monoxide to release carbon dioxide into the atmosphere. Combustion efficiency varies depending on factors like fuel, moisture and calorific value. Again the design of the stove or combustion system affects the overall thermal efficiency. Gasification is classified as thermal conversion technology of organic material to combustible gases. In research areas for power generation from biomass, gasification is very important for the reason that it is the main option to direct combustion. The main advantage of the advanced turbine design and heat recovery steam generators technology is that high energy efficiency can be achieved [27].

The main attractions of gasification are: 1. In contrast to combustion with 30%, gasification has higher electrical efficiency 50% while cost can be similar. 2. Advanced gas turbines and fuel cells have shown important developments. 3. Potential alternative of natural gas or diesel fuel used in industrial boilers and furnaces. 4. Displacement of gasoline or diesel in an internal combustion (IC) engine. Co-firing technology can achieve relatively high efficiency conversion of biomass into electricity. Co-firing involves burning a portion of biomass instead of coal in a coal-fired power plant. Many developed countries have been attracted to Co-firing of biomass with lignite, coal and fossil fuels. Biomass can be added up to 2% to the coal in a coal-fired power station without any adaptation of the plant. Most forms of biomass, including biomass wastes and energy crops, are suitable for co-firing. Usually unit size of Coal plant is up to 600 MW, where 15% co-firing would give 90 MW of biomass capacity, which will be considered 90 MW of green generation capacity [3]. The main advantages of co-firing are: 1. Co-firing can reduce sulphur emissions since biomass has lower sulphur content compare to coal. 2. Co-firing has very simple and cheap techniques. 3. Favourable environmental impacts compared to coal only plants. 4. Higher efficiency for converting biomass to electricity compared to 100% wood-fired boilers. 5. Planning approval is not required in most cases. CHP is an old technology; process has been used for almost two centuries. Energy efficiency can be significantly improved where the heat from combustion fuels can be captured and utilized through combined heat and power generations. Large scale CHP technologies usually utilize steam while smaller scale utilizes a range of technologies in the drive to maintain energy conversion efficiency.

Table-3: Main characteristics of biomass conversion technologies

CONVERSION TECHNOLOGY	BIOMASS TYPE	EXAMPLE OF FUEL USED	MAIN PRODUCT	END-USE	TECHNOLOGY STATUS
Combustion	Dry biomass	Wood logs, chips and pellets other solid biomass, chicken litter	Heat	Heat and Electricity (steam turbine)	Commercial
Co-firing	Dry biomass (woody and herbaceous)	Agro-forestry residues (straw, waste)	Heat/electricity	Heat and Electricity (steam turbine)	Commercial (direct combustion). Demonstration stage (advanced gasification and pyrolysis)
Gasification	Dry biomass	Wood chips, pellets and solid waste	Syngas	Heat (boiler), electricity (engine, gas turbine, fuel cell, combined cycles), transport fuels (methanol, hydrogen)	Demonstration to early commercial stage
Pyrolysis	Dry biomass and Biogas	Wood chips, pellets and solid waste	Pyrolysis oil and by-products	Heat (boiler) and electricity (engine)	Demonstration to early commercial stage
CHP	Dry biomass	Straw, forest residues, wastes and biogas	Heat and electricity	Combined use of heat and electric power (combustion and gasification processes)	Commercial (medium to large scale) and commercial demonstration (small scale)
Etherification/pressing	Oleaginous Crops	Oilseed rape	Biodiesel	Heat (boiler), electricity (engine) and transport fuel	Commercial
Fermentation/hydrolysis	Sugar, starches and cellulosic	Sugarcane, corn and woody biomass	Ethanol	Liquid fuels and chemical feedstock	Commercial. Under development for cellulosic biomass
Anaerobic Digestion	Wet biomass	Manure, sewage sludge and vegetable waste	Biogas	Heat (boiler), electricity (engine, gas turbine, fuel cell)	Commercial, except fuel cells

(Source: Chang et al., 2003)

Energy conversion efficiencies about 85% are possible with CHP operations. CHP is becoming attractive as technology for the following reasons [27]. Its features are: 1. Energy efficiency-CHP is about 85% efficient, in contrast to the 35-55% of the most traditional electricity utilities. 2. Growing environmental concerns-it is estimated that each MWe of CHP saves approximately 1000t/C/yr. 3. Energy decentralization-recent world market projections indicate that the market for generators below 10 MW could represent a significant proportion of the 200 GW of new capacity expected to be added by 2005 worldwide.

4. CURRENT STATUS OF BIOMASS ENERGY IN ALBANIA

Biomass potentials are very important in Albania's energy sources. The negative impact of energy crises arised in Albania since 1970s' and have shot up by entry of the Stabilization and Association Agreement (SAA). Better capacities in the field of renewable energy as bio-fuels are the pre-requisite option for Albania to respond to the membership obligations in order to fulfill the final goal of EU membership apart from the Renewable Energy Mandatory Criteria (REMC) that should be achieved by EU-27 countries [16]. As of now Albania has relatively high biomass potential to provide rural energy services based on woody and non-wood forest availabilities, agricultural residues, agro-industrial wastes, wastes from animal husbandry and urban wastes [21]. Household energy consumption in Albania is approximately 53% of total energy consumption. Various post harvest agricultural residues such as grain dust, wheat straw, and hazelnut shell can be procured under systematic practices and municipal solid wastes can be procured, processed under hygienic conditions as economical energy sources in Albania [35]. Total bio-energy potential in Albania in 1998 is shown in **Table-4.** According to the European Commission – Agriculture and Rural development [12], Albania's most predominant problems that definitely hinder the growth of the country can be summarized as: 1. Migration from rural areas, 2. Very limited size of holdings av. of 1.2ha compared to 23ha in EU-25 – divided up into 3.8 parcels), 3. Poor marketing of products, 4. Underdeveloped irrigation and drainage systems, 5.Low technological level, 6. Weak organization of farmers and 7. Low level of development of the agro-industrial and food processing industry.

Table-4: Recoverable biomass energy potential in Albania

Type of biomass	**Energy Potential (ktoe)**
Animal wastes	47.623
Dry agriculture residues	1,818
Firewood	6,393
Forestry and wood processing residues	7,937
Total	16,195.6

In general, there is low interest for investments in agricultural activities which may also shorten the new ventures of biomass conversions into bio-fuel energies. Although country's exports in the field of oil seeds, oleaginous fruits, raw hides, raw skins and other animal products show a largest value, it still imports food and food products[34]; this can be overcome by self sufficiency in creating better incentives at the rural sides for farming and farm related activities with improved irrigations, standard marketing strategies, innovative-indigenous technologies and strong farmer oriented organizations, not only to reach self sufficiency in food and food products but to procure bulky waste biomass for sufficient bio-energy

productions. Agriculture is the mainstay of Albania's economy and accounts for 25% of the GDP and 60% of the total employment an important human asset for bio-energy production from biomass [35] provided the current food production targets and food processing sectors are not hampered. Exploited agricultural area is approximately 1,122,000 ha, which is about 39% of the total Albanian's land (arable land is 578,000 ha; permanent grassland is 423,000 ha; crops land is 121,000 ha) again the food productive agricultural area must not be disturbed to harness live biomass for bio-energy sectors. Sources of biomass from the agricultural production are residues of after harvests (bulky wastes of maize and wheat estimated about 1,800 toe [35], food processing wastes and agro-industrial wastes. Crop productions and energy potentials from residues outsourced in Albania are shown in **Table-5.** According to the European Commission – Agriculture and Rural development[34], Albania's utilized agricultural area (UAA) is 1.16mio ha, which is 40.5% of the total land area, out of which half the land is arable (5,67,000 ha), 43% is permanent grassland (5,05,300 ha) and 8% (91,350 ha) is under permanent crops. Agro-industry Outlook is very promising in Albania. The biggest increases are in enterprises [34] producing tinned fruits and vegetables, refined oils, dairy products, breads, sweets, biscuits and wine. Thus enriching sites that generate abundant of food processing wastes for bio-energy faculty yet systematic productions to be surveyed.

Table -5: Crop production and energy potential from residues in Albania

Crop	Production 2006 kt	Approximate residues kt	Energy potential (toe/yr)	Energy potential (Gj/yr)
Wheat	508	1,016	417	17,429
Barley	6	12	5	206
Rye	3	6	2	103
Oats	23	46	19	789
Maize	245	1,470	603	25,217
Vegetables	688	1,032	423	17,703
Potatoes	163	326	134	5,592
Beans	24	48	220	823
Tobacco	2	10	4	172
Sunflower	2	4	2	69
Total	1,895	4,432	1,818	76,028

(Source: Toromani, 2010)

Qinami and Civici [28] have well documented the issues of "the competitiveness of the Albanian Agro-food trade in the frame work of trade agreements with the European community". According to the report, there is a greater tendency for agro productions within the country rather than imports which will definitely an assuring ways to access for bulky biomass wastes for bio-fuels. However according to Mancka [23], though agriculture is a very important sector in Albanian economy, it stumbles due to the lack of financing. The report stresses on analyses of agricultural development with economic development, credit trends and identifications of low lending problems, improvement recommendations in the loan sector etc, for the sustainability the agricultural and agro-industrial sector. This will be the most needed and regular agenda in not only shaping the country but in harnessing bio-fuel energy thro' the residues of agricultural and agro-industrial sectors. The energy reserves produced from urban solid wastes in 2002 are about 1.8 Mtoe, while predictions show that trend will grew up to 9.5 Mtoe in 2050. Urban solid waste potentials in some main cities of Albania have been calculated to be about 890 Ktoe in 2010[35]. The study

done by the Energy and Environment for Sustainable Development Center (EESDC) in 2008 shows that taking in consideration biogas from animal, the energy potential is about 585 GWh/yr or 2100 TJ [35]. According to [19], animal residues are mainly used as fertilizer. There are no systems of conversions of animal residues into bio-energy. **Table-6** gives the bio-energy potential of available animal wastes from the animal farms in Albania. According to the European Commission – Agriculture and Rural development of Albania [12], animal production accounts for about 46% of total agricultural productions and field crops production accounts for 42% and permanent crops for 12%.

Table-6: Biogas potential from animal wastes

Type of animal	2006 (K head)	Energy potential (toe/yr)	Energy potential (Gj/yr)
Cattle	634	13,337	558,006
Sheep	1,830	17,787	744,191
Goats	940	6,835	285,978
Pigs	152	491	20,563
Horses	132	7,686	321,590
Poultry	6,200	1,487	62,216
Total	9,888	47,623	1,992,542

(Source: Toromani, 2010)

Fuel-wood is main source of energy in rural part and as of now can be considered as the largest sources of bio-energy of Albania. Conversions of fuel wood into bio-fuel would be an improvised version to cut down carbon emissions and to harness more bio-energy. Existence of natural forest regions of Albania are shown in **Table-7.**

Table-7: Existence of natural forest regions of Albania

Forest type	Area (ha)	%	Volume (m^3)	%	Volume (m^3/ha)
High forest	454,572	44	61,965,000	75	136
Coppice forest	327,220	31	11,533,000	14	35
Shrub forest	261,925	25	8,163,000	11	31
Total	1,043,717	100	81,662,000	100	202

(Source: Toromani, 2010)

On record the total forest potential of Albania is approx. 125 million m^3. High forests accounts to 44%, coppices 31%, bushes 25%; Out of which as on date the utilized biomass reserve as fuel-wood accounts to 10% of high forest, 50% of coppices and 100% bushes[17], [18], [36]. Procurability of fuel-wood from the forest is continually increasing with relatively low growth rate due to slow generation. Based on the data obtained from the Forest Cadastre, the annual forest growth is about 1.44 million m^3 while the annual allowable cut is about 1.15 million m^3 which is 20% lower than the annual increment [35] that states an alarming situation. Albania has soils and a climate favourable to an extensive timber industry. Today forests cover about 1/3rd of Albania's land area and due to an agreement with Italy and the World Bank; there is a large amount of reforestation underway [1]. According to [16], annual forest wood utilization in Albania is about 2.75 million m^3 whereas the annual capability of forest based products according to national forest census of 2004 is 1.15 million m^3. It is obvious, that Albania is using 58% of woods beyond its current capability. According to the present situation, interventions in the way of converting

timber energy into heat are required to meet the need and improvising biomass technologies must be implemented to recover maximum utilizable energy in comparison to just burning as fuel wood as of now modern heating systems have been adopted that are most efficient than those earlier days of conventional stoves.

5 BIOMASS ENERGYAS VENTURING PATH IN ALBANIA

Due to worldwide alternations in the energy area, new prospect and challenges are created for renewable energy through bio-energy sectors. Available forests live biomass resources and available dead biomass as anthropogenic wastes and market-based studies an attempt has been laid to propose the areas of procurement, production, management and replenish able factors in the bio-fuel energy sectors. It's an obvious scenario that the energy demand will continue in future with an increasing trend; however, efforts have been laid to tackle the existing live biomass and to harness dead biomass wastes and one cannot they predict long-term energy demands on one hand and the shortages that may pose in future which arise with several queries; what would be the most priority bio-resources? Has biomass energy can be harnessed as renewable energy? Can biomass energy the ultimate goal towards bio-fuel energy? Which are the most utilizable and adaptable bio-fuel technologies and instrumentations? What are the ways and means to overcome the ever increasing demands both from the angles of productions and economic development? Thus it is to point out that the development of biomass energy will basically be dependent on the development of the renewable energy industry as a whole. Taking in consideration the long-term future, bio-energy has to prove sustainability in both environmental and social aspects.

Even though bio-energy development is still "young", the R&D is focused on the development of fuel supply and conversion methods in order to minimize environmental impacts [27]. However, from the angle of positive tendencies and the support of the Albanian Government, biomass as potential raw material provide cost-effective and sustainable energy supply for both private and public sectors that guarantee through ever growing waste biomass residues at one angle and in harnessing fuel wood biomass thro' improved technologies over existing conventional use and a securing ways for reforestation programs for future generations and as said by Demirbas[9], growing bio-fuel crops are sustainable that are less harmful to the environment and assist countries to fulfil their GHG reduction targets. Albania is one of the wealthiest lands in natural resource per square mile in the world. The predictions as per the document Invest in Albania [14], it is rapidly building its infrastructure and in the near future it will be one of the countries among many in the world to produce 100% energy. The country keeps taxes low as much as 10%. The country is a promising one for bio-fuel investments due **to y**oung population, low taxes, low labour costs, part of NATO, soon part of Europe, **g**rowing economy and International banks like raiffeisen, Pro-credit, BNP Paribas[14]. Biom-Alba project [2], has analyzed the feasibility of the establishment of a small pilot plant for the direct combustion of biomass from agricultural products such as olive oil solid waste. The study has revealed that investing in integrated energy systems based on the extensive use of the Albanian biomass is highly efficient. The Biom-Alba project[2] financially supported by the CEI, the University of Bologna, Italy (Dept. of Agriculture) has successfully aimed at identifying the economic potential and technical impact of the biomass supply chain in Albania. As per the news of Global Bio-energy Industry [33], ALBANIA - Italian company, Marseglia Group, has signed a $1.3 billion deal with the Albanian government to build a biomass energy park in northern Albania for the productions of 140-megawatt liquid biomass energy plant and two 234MW wind farms to provide an undersea power link between Italy and Albania and converter substations in the Lezha district, 60 miles (100 Km) north of capital Tirana. The project projects 100% eco-friendly and sustainable energy alternatives. Multifold models for planning agricultural regions within a context of irrigation areas are needed with given perspectives for sustainable development, regional planning, environmental decision making alternatives and biodiversity conservation programs [24], though the paper stress on utilizations of natural wood and non-woody biomass from forests and waste biomass at all categories for bio-fuel energies. ***According to***

the Commission Staff Report, Albania [8], local government in Albania is promising. The decentralization process has continued to make slow but constant progress and additional autonomy has been granted to local government units with local government boundaries redrawn with many smaller communes and to carry out under constructive political climate with the involvement of all stakeholders. These are the skeletal requirements for the involvement of locals in utilizing and stabilizing the activities of bio-fuel energies from biomass wastes.

CONCLUSION

Albania has an abundance of renewable energy sources and so far much of evaluation in terms of scientifically, technically and economically has been met with little efforts. Outsourcing biomass wastes of agricultural, agro-industrial, animal and urban categories need to be implemented under hygienic conditions thro' mechanizations and of course by creating job opportunities in the rural sectors. By tapping available waste biomass and careful utilizations of forest biomass the Albanian populations can rely on country's renewable resources for bio-fuel efficiencies and can decline import of energy which uplifts utilizable energy needs for all purposes. As an example, Chamber of Commerce & Industry, BERAT[7], is playing an important role in economy of Albania and such developers are in fact in need to collaborate in bio-fuel energies to make use of indigenous biomass wastes with indigenous technologies. In the current paper the authors call for an urgent processes of biomass energy generations for Albania stressing on sustainable biomass energy productions by the utilizations of man power through co-operative and/or big farm establishments and proclaim to initiate agro-industrial and/or industrial bio-fuels with incentive policies from government. Lack of knowledge of renewable energy production as resource to increase farm income among the agrarian communities of Albania can overcome. Agricultural Institutions and Departments of Animal Husbandry with Forestry and Engineering faculties must march hand-in-hand to tackle eco-friendly energy productions by utilizing Albania's natural geography and climate; available agro-climatic patterns and rural population; procurable biomass wastes of agricultural, animal and urban organics without the alternations of food productions but to safe-guard and strengthen the food systems.

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