الآية

قال تعالى:

{وَسَخَّرَ لَكُمُ الشَّمْسَ وَالْقَمَرَ دَائِبَيْنِ وَسَخَّرَ لَكُمُ اللَّيْلَ وَالنَّهَارَ }

سورة ابراهيم 33

{إِن يَشَأْ يُسْكِنِ الرِّيحَ فَيَظْلَلْنَ رَوَاكِدَ عَلَىٰ ظَهْرِهِ إِنَّ فِي ذَٰلِكَ لَآيَاتٍ لِّكُلِّ صَبَّارٍ شَكُورٍ }

الشوري 33

DEDICATION

To Those Who Gave Us Their Time, Love and Care Our Parents, Our teachers and every one inside Sudan University

To Our New Family 31 Batch

ACKNOWLEDGEMENT

Unlimited prayers for Allah as the number of his creatures might of himself, weight of his throne and the extension of his words. The work on this project has been an inspiring, over exciting, sometimes challenging, but always interesting experience. It has been made possible by many other people who have supported us. We wish to express our profound thanks; gratitude and appreciation to our advisor Dr. Salah Gasim for his guidance during our studies valuable technical editorial advice, suggestion, discussion and guidance were a real support to complete this project.

Also special thanks for every teacher who support us and helped us accomplish this project. We really appreciate their support that is the following project. We really appreciate theirs support works we would like express our deepest appreciation along with our gratitude to our parents, for their unlimited support and their hard work until we complete our marching education and entire this project.

ABSTRACT

Renewable energy is that clean, unpolluted and environmental friendly type of energy which is obtained from natural resources that exist every day and always well as earth exists, such as sun light, wind, hydro, tides and geothermal energy. The term electrification refers to the operation of supplying electricity by one of electricity generation means. Generally this project aims to support national grid with pure renewable amount of electricity. Many electricity generation stations using diesel generators, these generators emit CO2 which is considered as a major damage to the environment. Also these generators have a high operating cost due to the cost of fuel. The project focuses on electrification using PV system technologies. Photovoltaic system is a system that converts direct sunlight into electricity using plates manufactured from silicon, metal and glass called photovoltaic modules. It had been a clear vision that when PV system is connected with grids in different positions grids have different performance and it’s also clear that PV system should be connected to the lowest regulation position in order to improve voltage and power drop.

المستخلص

الطاقة المتجددة تعتبر طاقة نظيفة و غير ملوثة وصديقة للبيئة وهي نحصل عليها من مصادر طبيعية يومية غير ناضبة وتدوم بدوام الارض .موارد مثل ضوء الشمس و الرياح والطاقة المائية و الطاقة الحرارية من باطن الارض.

عموما هذا المشروع يهدف لدعم الشبكة القومية بالكهرباء من مصادر مستدامة . جل محطات انتاج الطاقة في مدن السودان تستخدم مشقات الوقود الاحفوري الديزل بوجه التحديد الذي يتسبب بالكثير من انبعاثات الكربون التي تخرب البيئة كما ان لها تكلفة تشغيل عالية مقارنة بانظمة التوليد الشمسية.

ينصب اهتمام المشروع بشكل اساسي على استخدام تكنلوجيا التوليد الشمسي بالستخدام مصنعة خصيصا لتحويل ضوء الشمس الى طاقة كهربائية مباشرة.

كان من الواضح خلال دراسة المشكلة انه عند تركيب النظام في مواقع مختلفة من الشبكة فإن أداء الشبكة يختلف كثيرا ولقد وجد انه من الأفضل تركيب النظام مع الموقع الاقل نظامية للجهد ، ففي حين تركيبه اقل نظامية تتحسن نظامية الشبكة الكلية وكذلك الفقد في القدرة.

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LIST OF ABBREVIATIONS

PV	Photovoltaic
DC	Direct current
AC	Alternative current
NEC	National Electricity Company
KW	Kilo Watt
MPPT	Maximum Power Point Tracker
KVAR	Kilo Volt – Ampere Reactive
L.F	Load Flow