Sustainable Kitchen – An Energy Transition Project

Background

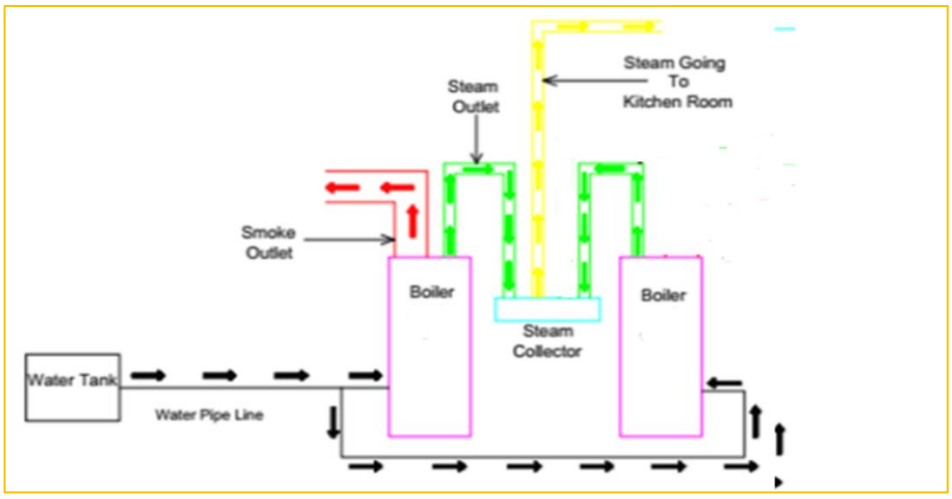
Serving nutritious, healthy food to all is a herculean challenge, given there is no automated and modern cooking equipment in most of the community kitchen in Indian in present scenario. It is also evident that in most of the kitchen skilled labor is hard to source from the local community. Thus, automation and modernization of the kitchen is a must to continue serving healthy food while continuing to employ locals. Most of the present community cooking system depends heavily on wood fire/Gas in absence of modern combustion system. As such the project aims to incorporate boiler run by solar energy with pre heater water from again solar sources to optimize and minimize fuel consumption. Also, the byproduct hot water can be used by the students for bathing and washing clothes.

Technology and Concept

Solar Energy is used to run single phase boiler to generate steam that is further used for cooking. Since the solar energy is used directly run the kitchen it is sustainable, healthy and also the places can be kept very hygienic. Three stages solar energy are used for the kitchen.

A. Pre heating of water for cooking using solar heater.
B. Using boiler run by solar energy for steam cooking.
C. Using solar energy for heating pan or induction to prepare frying kind of items.

Typical Boiler Arrangement.



Two numbers of boilers are envisaged depending upon the number of people for whom the kitchen will be designed. Two number of boilers are considered from reliability point of view. Boilers are designed with NON-IBR and thus no approval is required. The pressure of the boilers does not cross 7 kg and capacity of steam production depends on the requirement of steam for the cooking.

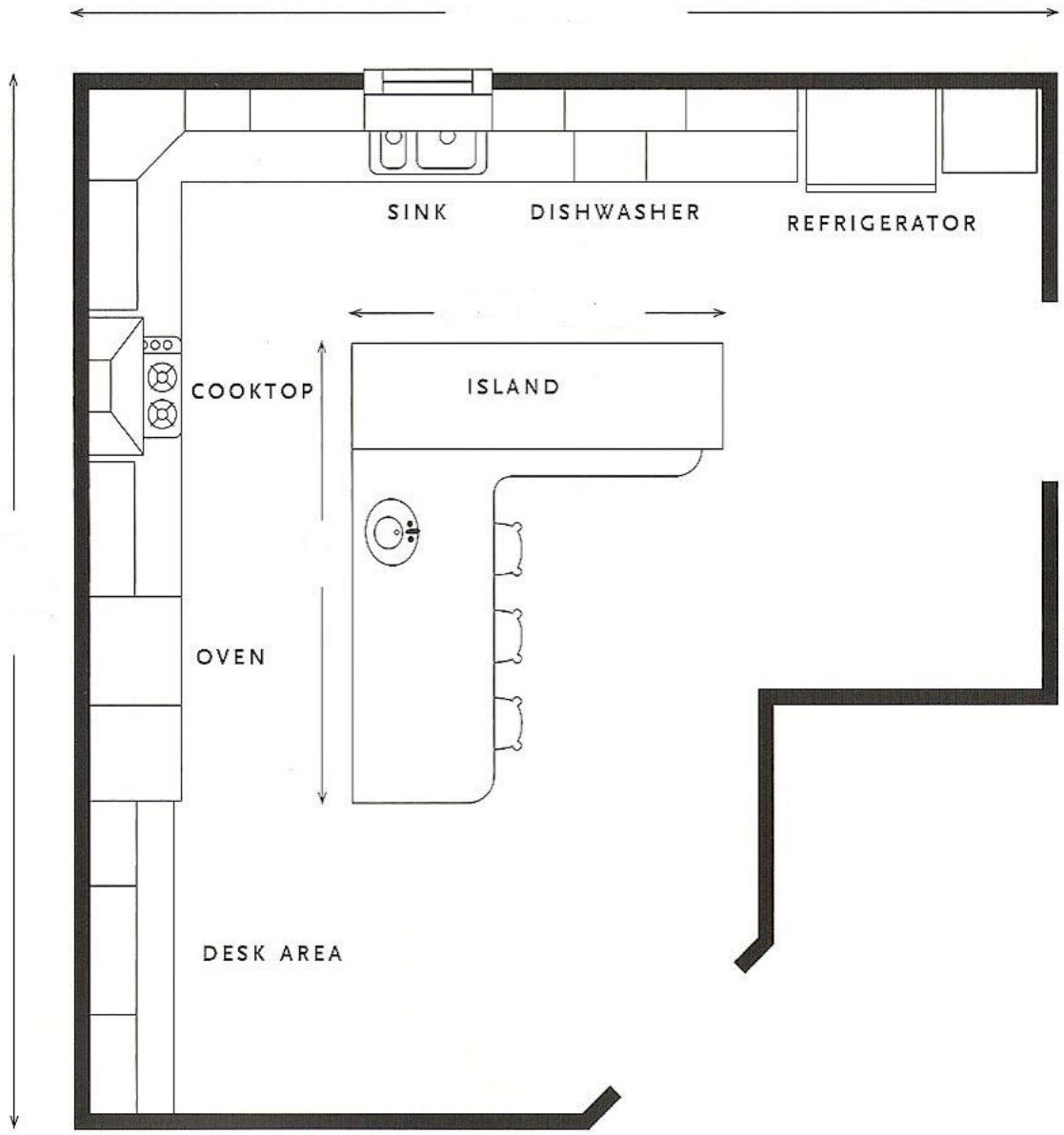
Designing of the boiler and kitchen equipment are carried out once the requirement is known.

Automation of Kitchen

Kitchen is designed to use less amount of manual labour. Thus, the pressure cooker for all kind of preparations like a) Rice b) Dal, C) Sabji vegetables are used with automatic cleaning solution.

Lay out Preparation

Kitchen layout is prepared based on the requirement of the kitchen and capacity of the cooking system to be designed. However, a typical kitchen may have a following layout.



Various Equipment in the kitchen

Sr.No.	Product Description*	Sr.No	Product Description*
1	Electric BOILER	15	DOUGH KNEADER
2	RICE COOKERS	16	WET GRINDER
3	VEG CUTTING MACHINE	17	GARBAGE TROLLEY SS
4	STEAM PR. COOKER	18	WORK TABLES
5	STEAM PIPING & FITTINGS	19	LPG BURNERS

6	INSULATION	20	DIESEL BURNERS
7	VEGETABLE WASHING SINK	21	G.I. DUCTING
8	SS KADHAI	22	AIR BLOWER WITH STAND & MOT
9	SS PATELA	23	FLY CATCHERS
10	SS RACKS	24	DRAIN COVERS
11	RICE COOKERS	25	ONOIN /POTATO/GARLIC/COCONUT
12	SS HOODS WITH FILTERS	26	COLD STORAGE
13	POTATO PEELER	27	WATER TREATMENT PLANT
14	GRAVY MACHINE	28	TRANSFER TROLLEYS RICE/DAL/VEG

*The list is not exhaustive.

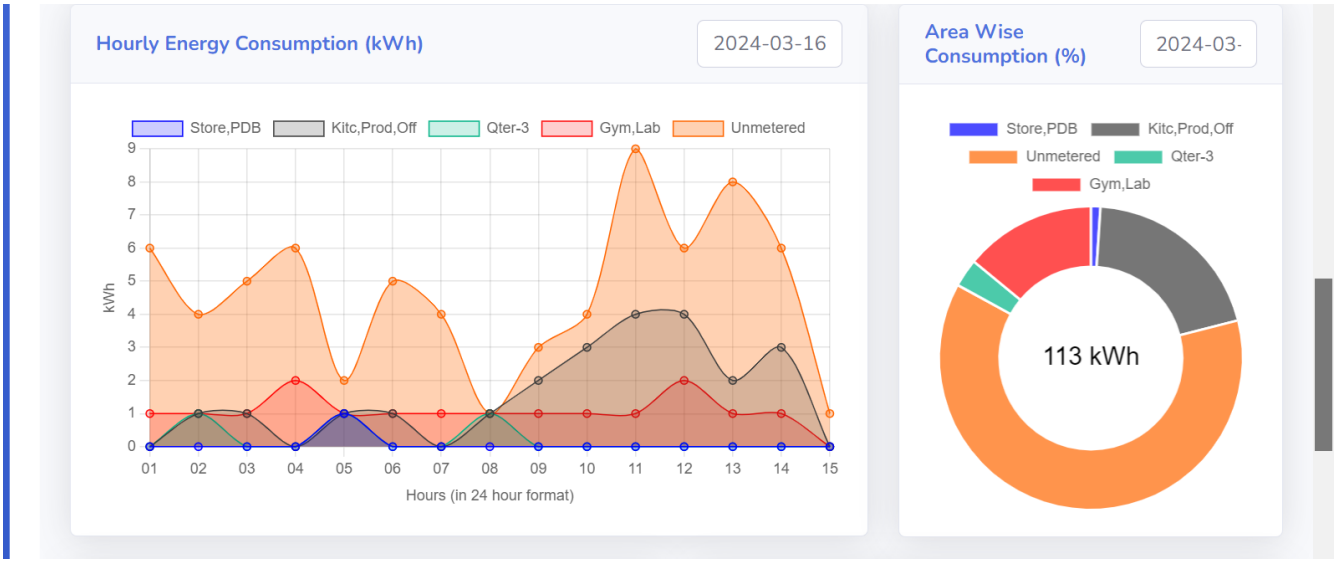
Typical pictures of various items

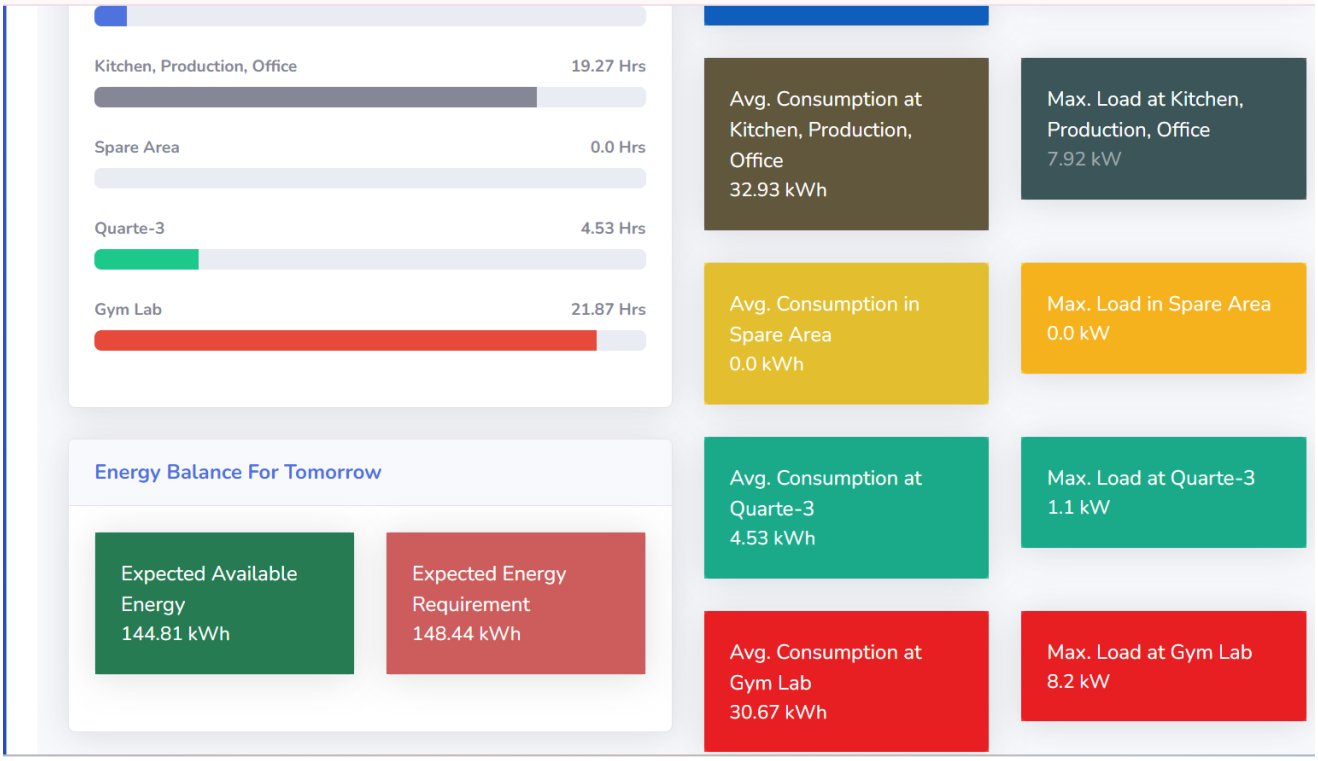
Time Duration

Activities Head	Working Days
Design and Selection of Materials	50
Supply of Equipment	120
Installation	40
Total duration	210

Energy Analytics – Dash Board

The solution is developed with Dashboard. Energy Planning, Energy generations, Energy consumptions, stitching output in terms of kilometre per hour per day and economics are available with the solution.





Advantages of Sustainable Kitchen

Cooking takes less time and less energy consumptions. Since the energy consumptions comes down, the cost of cooking comes down drastically. The food is extremely hygienic as the cooking areas are kept to be very clean and neat. Sustainable cooking is a scalable with customized options and it does not affect on the cooking practices.

Conclusion

Sustainable Kitchen is a value-added concept of Sustiknow Advisory on application of Solar Energy in a day-to-day life for productive use. With the available energy from the Sun, the community kitchen at least can be converted to fully sustainable and thus bring a change in energy usages in cooking. Sustiknow provides end to solution and offer a certain amount of time for handholding,

1. Team

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