

Review Solar Powered Furnace Cremation Process

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Abstract - Cremation of a dead body is the major religious practice in Hinduism. It is performed in bright daylight and not at night. As the sun is also available in the day so its solar power can be best utilized for the cremation process. In cremation of a dead body it requires a lot of wood to burn the body completely, around 600 kgs. To meet this huge demand for wood a lot of trees are cut down. This ultimately results in two things: global warming is caused as there will be less tree and pollution caused by the burning of wood. So today we need to shift to sustainable and renewable energy sources as these fuels are limited like trees. Solar energy is the greatest blessing to human being; this energy source is available for free especially in regions like India. It is a clean source of energy with almost zero pollutants. A lot of environmental problems can be tackled using solar powered cremation. So in this paper we are discussing the use of solar crematorium and its economic viability in India.

KeyWords: Crematorium, Scheffler reflector, Concentration Ratio, Solar, Tracking, Cost etc.

1. INTRODUCTION

India is dealing with the dual issues of rapid depletion of traditional fuels and environmental degradation. There is an pressing want to lessen dependence on petroleum and different traditional fuels for higher financial system and environment. Utilization of sun electricity can cope with each of these issues. Photovoltaic modules and panels, which convert the daylight into energy however that isn't the case here. Since the daylight has little or no electricity, best 20% of its electricity is used for lights and a big portion, 80% as thermal electricity. So electricity from sun radiation may be applied extra in sun thermal electricity technology than in sun photo-voltaic (which makes use of best of the lights impact of daylight) for electricity technology. A crematorium too calls for a completely big quantity of warmth electricity which may be harnessed without delay with the aid of using a sun concentrator. On the alternative hand, we are able to by no means endorse the use of sun photo-voltaic panels to achieve one of these big quantities of warmth circuitously for cremating a corpse. Firstly, PV panels convert best 20% (lights impact) of sun electricity into energy, after which this energy is transformed into warmth with the aid of using passing thru a completely excessive quantity of resistance. This conversion of energy into warmth is likewise related to numerous losses. So using sun PV panels will now no

longer be viable for cremating a corpse. These PV panels may be used to get energy for strolling add-ons like tubes, enthusiasts in office/cabins and essential automobiles mounted withinside the monitoring system

2. LITERATURE REVIEW

Not tons sizable and committed paintings is visible after reading quite a few exceptional famous journals. Few works had been said and delivered on this paper for sun furnaces and value estimation of sun equipment. The biggest sun furnace is placed in Font-Romeu at Odeillo withinside the Pyrenees Mountains. It is operational due to the fact 1970. This is the identical vicinity wherein the world's first sun furnace became built; this sun furnace became installed region at Mont-Louis in 1949 with the aid of using Professor Felix Trombe. Odeillo and Mont-Louis are inside 14-15 km of every other. The furnace uses an array of ten thousand mirrors to mirror daylight right into a massive concave hemisphere which then focuses the power onto a place kind of the scale of a cooking pot. The flat mirrors song the solar in unison and redirect the sun thermal power closer to the crucible that is getting used for melting steel. World's first sun crematorium is being evolved in our U.S. at Goraj village (30 km East of Baroda) in Gujarat country with the aid of using Muni Seva Ashram with the assist of Ronnie Sabawalla. During 1998 they commenced with a mainly designed Scheffler reflector with 50m² replicate surfaces. But its preliminary concentration-aspect of approximately C = a hundred became out to be never sufficient to permit right cremation.

3. CREMATION PROCESS

A crematorium is a furnace this is capable of generate temperatures of 760–1150°C to make certain disintegration of the corpse. Cremation is the manner of burning a lifeless frame at very excessive temperatures till bones left, which might be then convert into "ashes." The ashes may be stored in an buried, distributed or maybe included into gadgets as a part of the rituals of death. The warmth increases the temperature of the box. While the cremation, the more part of the frame (mainly the organs and different gentle tissues) which consists of seventy five percentage water is vaporized and oxidized with the aid of using the extreme warmth; gasses launched are discharged via the exhaust. As the gentle tissues start to harden, burn from the warmth, the pores and skin turns

into waxy, discolored. The muscle starts off evolved to char, flexing and increasing limbs because it tightens. The bones, which might be the remaining to go, turn out to be calcified as they may be uncovered to the warmth and start to burn. The time for cremation varies from frame to frame, and, in contemporary-day furnaces, the manner can be as rapid as an hour in line with forty five kg of frame weight. A common human frame takes from to 3 hours to burn absolutely and could produce a median of 1.four to four.1 kg of ash.

4. CONCEPT OF SOLAR CREMATORIUM

The fundamental idea of sun crematorium is to fire the useless frame domestically everywhere and in any case with the assist of a massive concentrating reflector which is having very excessive CR and to keep the combustion of the useless frame via way of means of offering the clean atmospheric air with the assist of a blower. Once combustion of useless frame begins off evolved in the cremation chamber, it additionally releases warmth which in aggregate with sun strength received from concentrating reflector keeps non-stop burning of useless frame till whole useless frame receives transformed into ash. Based on above stated idea, device of sun crematorium may be divided into following components : one is Scheffler Reflector, second is Tracking System, third is Cremation Chamber, and last and one of the very important part Backup device for non sunny hours.

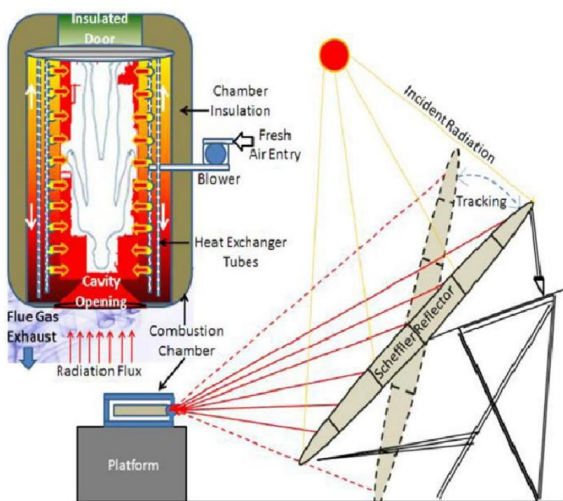


Fig - 1: Diagram of Solar Crematorium

5. SCHEFFLER REFLECTOR

the Parabolic Scheffler Reflectors which can provide you (you) with a wide range of temperature in all kinds of cooking, steam technology and plenty of different applications. Their specialty is a flexible ground bend and a fixed focus area. Their use is very much used in many areas especially in regions like india

5.1 Designing of the Scheffler Reflector Model

The Scheffler reflector's size (Aperture Area) is determined by an opposing layout technique. Which is defined in a step-by-step manner as follows:

First of all the “E” (total power) required to completely burn the unmarried frame is calculated. As a typical Hindu funeral procession lasts 2-3 hours and consumes 450-550kg of open wood to burn the corpse completely. But Mokshda, a Delhi-based non-governmental organization, has created a mortuary that has the potential to reduce heat loss. With it, it takes 2 hours and one fifty to two hundred kilograms of wood to burn the corpse. According to Vinod sir who is the , founder of Mokshda, at just the right temperature, 22 kg of wood is enough to heat a frame. Considering the above facts, 100kg of wood is used for cremation of an unmarried corpse for 1 to 2 hours if heat loss is improved to a minimum by means of a strong separation of the combustion chamber. the caloric value of the timber is 19700kj / kg. Therefore

$$E = 100kg \times 19700kj/kg = 1970000kj = 1970MJ$$

Now “P” which stand for power needed to the dead body from inside the combustion chamber is determined. If we layout a reflector to cremate a lifeless frame in 2 hrs then this (general energy) “E” required to burn the lifeless frame absolutely should be obtained/captured with the aid of using the reflector inside 2hrs.

$$\text{Therefore } P = 1970MJ / 2Hrs = 985MJ/Hrs$$

$$A = P / DNI = 985MJ Hr 5MJ m2 Hr = 197m2$$

5.2 Material of Scheffler Reflector

The Scheffler reflectors are constructed using small double sided aircraft mirrors. Theoretically a unmarried sided reflect is enough for the Scheffler reflector, however a double sided reflect is used to defend the silver cloth that's covered at the nearly absolutely obvious glass. Because of the extreme warmth and temperature of sun electricity there may be a opportunity of silver coatings melting farfar from the rear floor of the glass. Therefore the rear facet reflect protects the silver coating from melting away through reflecting again the daylight if any from the rear facet, and concurrently through keeping off the erosion and corrosion. This rear facet reflect additionally offers extra electricity to the the front reflect.

The performance/reflectivity of numerous aircraft mirrors withinside the Scheffler reflector stages ninety-ninety five % whilst new. Though it isn't always essential an awful lot

more, due to the fact performance is significantly taken into consideration wherein we have pay cash for energy/fuels which (sun energy) is loose here. The performance/reflectivity of the replicate is best taken into consideration to decide the size that is (aperture area) of the Scheffler reflector.

5.3 Tracking System

Since the crematorium is tied to a desk and is now motionless, solar attendants need a Sun rental, as a result of moving attention. This is the main task of designing a solar eclipse for the nursery. This suffering turned into a solution for Wolfgang Scheffler, who invented a brand-new scheffler reflector that monitors the Sun which is without changing its focus. In this paper, the scheffler display is redesigned to determine the specified size (opening position) of the concentric connector to obtain as much sufficient heat capacity to burn the corpse. As a special feature of the Scheffler display is the curvature of the curved floor and the fixed fixed position. Their use has now become a growing number of celebrities in many parts of the world, especially in India. Almost all concentrators have a fixed shape and attention, a new area where all the softness is focused, actions along the path of the sun. does not apply to use.

6. BACKUP FOR NON-SUNNY HOURS

The actual efficiency of solar energy can be seen unless you are in very hot weather days but the demand for energy becomes more intense in rainy or in the cloudy or slightly warmer areas. So it may be unreliable. On the contrary, we think of using this solar technology for the hindi rituals . This exacerbates the problem regarding the feelings associated with the cremation process. As is the custom in Hindu culture, there is a long history of cremation. And now there should not be any part of the body left untouched. Otherwise the soul of that character will remain dissatisfied, and will be transformed into a devil or im so that you can abuse or intimidate a troubled spouse and children because of his or her satisfaction. so to counter this big issue as during cloudy days we will not have enough sunlight to burn each and every part of the bosity so as a backup we should have Biogas or we can have Biomass or we can also use LPG / CNG or even petrol can be fired if necessary.

7. DEVELOPMENT OF SOLAR CREMATORIUM

principle undertaking is to make a completely small focal area, the complete body needs to be adjustable for precise positioning at some stage in the special seasons of the year. Electrical DC vehicles with gearboxes ought to be set up and examined for an stepped forward seasonal adjustment . All the elements ought to grow to be very specific for you to have minimal errors withinside the focal area.



Fig - 2 : Concrete Reinforced Foundation Platform 6.3 X 9 m² under construction Where chamber will be placed

The region near the river is preferred because of the brand-new crematorium. Accurate North-South alignment is marked so we are able to integrate the legal formats into this sub-area. Sight should be round 240mm wide but in the morning and at night when the body is twisted which eventually becomes more visible. The stand, rotating guide and body wings and small parts were given sand and the primer was changed twice as a spray to prevent decay. Finally the demonstration was held at a brand new suspension site (income season in rural areas). Body parts are established on the ground rotating guide. Immediately due to the concrete being reinforced, the stand and back-crane stand (lifting up and down stairs) are erected with the help of a mobile crane. . The precise alignment of the stand (bears corresponding to the polar axis) has changed to a correction. During the various stages of the actual school performance are integrated which allows you to enable the operator to use the gadget efficiently. After the mirrors were all set up in the body bags (see Figure: 3) we also needed a crane to lift the finished body..



Fig - 3: view of the cross bar stand

With rotating support on the stand bearings. Before lifting a stand with its reclaimed crayon, every electrical installation needs to be inspected. Seasonal changes are currently controlled so that the body has the proper paraboloid of the day. The appropriate top and the right example include a provisorily degree to measure the focus area because the room area is not always right at the

moment. As mentioned within the summary, the focus area is 240 mm wide. To be able to twist precisely between morning and night mode, eight more than four twisted wires are connected to the four corners of the body by a flexible telescope column in the center of the body.



Fig- 4 : Chamber (front) arrives.

As quickly because the platform is ready, the chamber may be tested. If the temperature in the chamber is achieving eight hundred diploma Celsius, then 1 animals which are small like e.g. lifeless bodies of puppies may be cremated with the experiment that it can be used for the cremation of humans and no problem will occur during it. as in india as it is a ritual to cremate bodies thus no problem should occur while the rituals are happening so that noones emotions are hurt.



Fig - 5 : Dead body in Crematorium

8. FEASIBILITY STUDY IN INDIA

Contrary to popular opinion, electric crematoria are more likely to cause more pollution than the traditional Hindu cremation practice, in relation to cremation. The UNDP file declares that the electric-burning corpse is one of the seven major forms of heat-induced emissions compared to traditional Hindu rituals. The extra-crematorium appears to be a possible alternative, according to V Ramesh of Karnataka Renewable Energy Development Limited. India is at the forefront of this, with Baroda, the largest city in Gujarat prepared for the world's first cremation site. It has been upgraded with the help of Wolfgang Scheffler, a

Swiss nationwide and Ronnie Sabbawala of Rashron Energy and Auto limited. The frame is only burned by the use of solar energy. 2nd Cemetery will be built in Patna, Bihar, with the help of 2015.

But this process is even worse. Cremation sites are not possible in most areas of India during the winter season and the monsoons seasons . Also, they can be used all day long as long as the sun shines. Built with the support of the rupee Three Crores, the crematorium no longer needs energy or gas. It makes it effective and cost effective.

Applications in remote valleys where wood is less and other resources are less. cremation can be high beneficial . most of the rural people in india are poor so they can also not afford highjly In northern India, crematoriums may be located at the Yamuna Ghat which are present near Nigam-Bodh Ghat which is located in Delhi, Bass-Ghat which is near Ganga in the bihar district Patna and Banaras above Haridwar and various other locations are also there.

8.1 Factors Influencing Crematorium

Key elements affecting call for for burial and cremation centers are:

Population: Running price of a crematorium might be particularly low wherein there may be a big populace. Here in India, there may be no trouble with the populace as India is the second one maximum populous United states of america withinside the world. And the populace too is growing at a completely excessive price. in india most of the areas are densely populated like delhi , mumbai, kolkata,uttar pradesh so the economics of scale can be easily achieved and thus the cremation process can become economically viable

Age Structure: The preferred mortality price conceals brilliant versions in keeping with age. Hence there may be very excessive significance of inspecting the age shape of the given area (locality). Whilst the populace is projected to grow, especially withinside the pensionable age businesses that have the very best dying prices, the decreasing dying prices will end result in a particularly small upward push withinside the wide variety of deaths. Mortality prices are maximum among the elderly, who constitute a developing percentage of the populace of India.

Mortality Rates: Mortality prices have fallen drastically over the past hundred years and could preserve to fall due to advanced clinical centers, ensuing in falling numbers of deaths.

Religion and Ethnicity: Religious perception can play a good sized position in human beings's preference among burial or cremation. Demand for burial and cremation

centers is for that reason inspired with the aid of using the spiritual ideals of the citizens of an area. Ethnic origin, like spiritual perception, can affect human beings's preference of burial or cremation. For example, cremation is extremely important in hindu religion as most of the dead corpse are cremated using woods and some other material . as hinduism is extensively spread throughout the world and consist of good percentage of population in the world so it becomes a topic of deep importance. also other religions like buddhism also values cremation. other ethnicity which believes in it are roman . church of the scotland etc.

Cremation Facilities availability : People's mindsets are converting from burial to cremation. The equal can be advanced relying upon the to be had facility of cremation.

Location: A latest crematorium has an possibility to compete with present crematoria on the premise now no longer most effective of vicinity, however additionally the first-rate of the centers and the carrier it provides. Since as according to spiritual ritual a few burnt a part of the lifeless frame is permitted to go with the drift withinside the water, consequently ideally, the brand new webpage have to be positioned close to the river. The major clients making the choice to apply to a selected crematorium are bereaved (whose household are lifeless) human beings and the funeral directors. The affect of spiritual ministers is insignificant in my view, because the funeral vicinity is generally selected previous to their appointment to steer the carrier.

8.2 Case Study of a Solar Crematorium in Gujarat

A religious place in Gujarat country, located in the northwest of India, has been the place for the first solar crematorium. The old village of Goraj Near the city of Waghodia, district of Vadodara district of Gujarat country is positioned in our u . s . wherein an existing, however not-operational, primary sun crematorium is mounted close to Ashram at the "panchayat land" beneath neath the authority of ecologically aware of the Ashram seva muni.

Introduction of the Problems :India is dealing with the dual issues of rapid depletion of traditional fuels and environmental degradation. There is an pressing want to lessen dependence on petroleum and different traditional fuels for higher financial system and environment. Utilization of sun electricity can cope with each those issues. photovoltaic modules and panels , which converts the daylight into energy

the mounted crematorium is non in operation. There can be defective layout of sun crematorium due to which need enough temperature might be now no longer done to absolutely burn corpses or, aperture of collector can be small to gather enough quantity of sun warmth

electricity for entire burning of useless frame. Maybe human beings simply don't come there due to any right connectivity of street delivery from close by huge towns like Vadodara and Ahmedabad or, perhaps cremating fee in step with useless frame is simply too high. Probably that area is geographically now no longer appropriate consistent with the sun map or there may be no right sun electricity policy.

Geographical Appropriateness: Today the earth is headed for herbal assets which are certainly renewable and decaying due to the fact withinside the present day era, many pollutants and worldwide warming troubles are being skilled in nearly each advanced u . s .. Gujarat is the maximum advanced country of our u . s . so there may be a hassle of pollutants and worldwide warming. As the country of Gujarat is in this type of sun quarter wherein the once a year common of daylight is five. five to 6. zero kwh / m² / day. This quantity of sun radiance is greater than sufficient for sun panels. The mortuary positioned at Muni Seva Ashram is positioned at the banks of the Dev River that's a tributary of the Dhadhar River. The crematorium is consequently prepared to be a spiritual ceremony of Antim-Sanskara.

Government Policy: As Gujarat is the maximum advanced country of our u . s . so there may be the hassle of pollutants and worldwide warming. This hassle of pollutants and worldwide warming has been diagnosed via means of the Gujarat nearby government. As the Gujarat location is in a location much like the sun belt wherein the once a year common of daylight is greater than sufficient to shop for sun panels so GEDA has recommended the set up of greater sun electricity initiatives withinside the province. Gujarat is presently the biggest sun strength plant in India.

Design and Development: At the environmentally pleasant Muni Seva Ashram, a 50m² Scheffler meal will warm up the hearth. The venture became advanced in collaboration with Wolfgang Scheffler and Ronnie Sababala

Opening Diameter of cremation chamber = d = 24cm
Receiver Area = $A_r = (\pi/4)d^2 = \pi/4(24/100)^2 \text{ m}^2 = 0.045238934 \text{ m}^2$.

$$CR = Aa / Ar = 50 / Ar = 1105. 24266$$

According to the above figures of CR, the goal temperature is above 1000 ° C that could without difficulty burn a person's frame inside approximately forty to 60 mins at some stage in a brilliant sunny day. The crematorium is designed as a room with a unique scheffler show designed for this concept. Special reflectors are designed to warmth a 2m chassis at a top of greater than 800 ° C. The facility is activated for trying out only.

In our view, the dimensions of the scheffler collector is 50m2 inconsistent as our scheffler show layout is defined withinside the preceding paragraph. Since the dimensions (beginning area) of the sun collector need to be same to 197m2 otherwise, the collector will now no longer be capable of acquire a enough quantity of sun warmness electricity to burn a useless frame inside 2-3Hrs.

The Chamber is designed in one of these manner that the rays of the solar replicate its internal wall and attention at the plate in which the human frame is stored. Thus, utilizing most use of sun electricity and growing its general performance. The performance of the heating chamber insulation is ready 80%.

Examination of small portions of meat regarded hopeful. However, Ashram will now no longer be capable of installation a sun mobileular to be used until



Fig. 6 : Solar Crematorium at Goraj village

A biogas and biomass and CNG andPNG backup burner arev installed. People throughout the location made clean that they could welcome in the chamber if a burner as backup took over operation throughout cloudy hours. Otherwise, a frame might also additionally best be 1/2 of burnt so one can harm the feelings of involved relatives.

As according to the verbal exchange with Mr. gaurav Gadhia Ashram is now trying to find an green answer with the help of biogas, that's made in a farm inside 20-30 km of the sun crematorium. As quickly because the finances for the biogas backup are available, the bottled warmth supply may be introduced and in the sun crematorium can in the end begin to operate.

9. ECONOMIC ANALYSIS

Despite sun radiant strength is free, the device required to transform it into beneficial form (thermal or electric) isn't free. Therefore, a value need to be assigned to sun thermal/electric strength that displays the conversion

device value prorated via way of no. of kwh brought via way of sun device. If sun value is much less than that of different strength assets which could carry out the identical task, there may be an financial incentive to sun strength. The reason of financial evaluation is to increase financial savings by using sun strength.

It is hardly ever value powerful to offer all strength necessities of thermal or mechanical structures by sun strength. If this had been done, the sun device could be able to imparting 100% of strength call for for the worst set of running situations ever expected: inclement weather, most call for and no sunshine. A sun device able to imparting height call for for a prolonged duration could be outsized for all excessive situations; it'd accordingly be substantially outsized. An outsized device offers greater strength than the requirement. A sun device with this kind of low load aspect is uneconomical and impractical. Therefore the first-rate use of sun device is together with traditional fuels that are used as an auxiliary supply for unique excessive call for situations.

Non sun structures generally have surprisingly small preliminary prices and excessive running prices reflecting decrease lifetime. Solar structures but are surprisingly high-priced to start with however have negligible jogging prices all through lifetime. Therefore if choice of device is made on the idea of preliminary value only, sun structures could hardly ever be selected.

9.1 Factors Affecting Cost of New Crematorium

Factors Affecting cost of new Crematorium	
Factors	Influence
Location	land cost Cost of internal roads new utilities cost
Design	Size construction types and materials Number of cremators equipment

A brand new webpage should be 7 to 8 hectares (2.83 to 3.24 hectares) and placed near a river, ditch, lake, lake or ocean as per the non-geographical practices a few hot part of the frame is allowed. wandering in the water. The crematorium should have excellent communication on the highways. Land prices vary widely, especially when real estate agents wish to advertise their land sooner or later within the housing development area.

The installation of advanced petrol, energy and water supplies can form a large part of the budget, depending on the proximity of the appropriate resources. For example, where key parameters will be found near a web page, fuel line setup will have a value of between ₹

60000 and namandla ₹ 68000. However, the cost can be greatly increased by distance: for example, a local power converter can cost R216000. In most cases, the cost of cremation improvements can be calculated under the following headings at the appropriate manual cost:

Installation Cost	
Items	Estimate in ₹
skilled fees	700000
Site survey, worroads and parking	3100000
Building the structure	7000000
Building of the furniture and fittings	900000
equipment of cremation (single	9500000
Net total value	15200000

This estimate excludes the fee of land and any extremely good software set up costs. Sufficient land could possibly fee at least ₹600000. Thus an affordable spherical discern for the fee of constructing a brand new crematorium in India

Thus primarily based totally on the discussions, fee of crematorium may be divided into following parts below **Operating Cost, Cost cremation equipment, Premises fee.**

9.2 Operating Costs

The major fees related to running a crematorium are:

- worker
- Maintenance equipment
- care of homes and grounds

The wide variety of group of workers varies among crematoria, with normally fewer hired at privately owned sites. Clearly, the unit value in keeping with cremation of the group of workers and every other value object is decreased via way of means of extra cremation no..

so as to offer a excessive first-rate service, there need to be enough educated group of workers. The situations of employment and activity detaied for crematorium group of workers at a brand new crematorium could be special from present practices which have been installed through many years. Flexibility among personnel is the important thing to success. The given chart beneath indicates the employees that we can also additionally advocate for a brand new crematorium in large Indian towns like chandigarh or varanasi :

Operating Cost of Employee			
Position	Annual Salary in ₹	Number	Total Costs in ₹
Manager	340000	1	340000
Administratio n	300000	1	300000
Operator	24500	2	490000
Total			1130000

Total cost is equal to ₹1130 every cremation based on thousand cremations per year.

9.3 Cost of the Crematorium Equipment

generally , crematoria have established the most range of cremators viable to allow the cremation of all our corpse at the equal day because the funeral. it has nevertheless decreased massive extra time working.

today it is extensively known that a crematorium have to perform as few cremators as viable on the way to limit the environmental effect of cremation. National codes of exercise had been modified to allow the retention of coffins in a single day to allow the maximum green use of cremators.

If the personal region is constructing and working a brand new crematorium task one thousand to 1200 cremations in step with 12 months, they might possibly deployment most effective one cremator. This might limit the capital and operational prices in addition to the environmental effect. Cremators paintings maximum correctly and purpose least effect to the surroundings if they may be used continuously, in preference to be allowed to chill . five day operation unavoidably manner that a cremator cools during the weekend, however storing coffins in a single day as suitable allows the range of day by day cremations to be equalled out to help in decreasing temperature versions and regular thermal surprise at the refractories.

One manner round this difficulty might be to to begin with deployment most effective a unmarried cremator, however with a dual plant. In the fourth 12 months of operation, a 2d cremator can be added, allowing the cremator to hold working in the course of the re-line of the primary cremator withinside the fifth 12 months.

This choice might lessen the preliminary capital required and optimize the performance of the primary cremator in the course of the primary four years. Once 2 cremators

had been established, the maximum green operation can be accomplished through the use of every for two weeks alternately.

The layout of the constructing have to permit for clean delivery, set up and destiny protection of the gadget. Management have to have bendy personnel rota structures to make sure the maximum green operation of the gadget.

Equipment Purchase Costs :

Facultatieve Technologies is currently the head of the United Kingdom market for cremation sets and weight loss gadgets. A single FT111 burner can cost a variety of R3832000. These include: construction and setting of gadget, automatic boiler cleaning, garbage fueloline removal, hot plate heating switch, electrical and mechanical setup, authorization and inspection, staff training. In addition to those costs, a burner may need: a box charging system, a mortuary gadget, and a box garage. These items can cost between R336000. Therefore the setup costs associated with the cremation gadget can be ₹ 4166960. If the target switches to match the 2nd heat exchanger during the 4th year, the initial price of the lowering plant may be more , giving the initial standard setting of ₹ 4446950. A 2nd heater can cost about R1080000 at today's cost.

Equipment Operating Costs :Unit expenses may be dramatically decreased via way of means of improved throughput, as an awful lot of the strength utilized in warming the cremator is misplaced thru inbetween operation. Cremators that obtain 5 or extra cremations according to day maintain warmness strength and as numbers increase, gasoline intake according to cremation decreases. annually figures of one thousand cremations, fifty working weeks a five day running week, a crematorium could simplest of four cremations according to day.

Cremation instances the use of cutting-edge cremators may be on common among 70 and ninety mins. few days in the week appeal to extra funerals than others and call for at the cremator might be evened out via way of means of the garage of coffins overnight, according with countrywide rules of practice.

Costs will vary depending on variety of cremation equipments. we may also provide the subsequent manual expenses for the functions of its economics have a look at primarily based totally at the effective use of FT111 cremator to cremate one thousand cremations according to year. currently , the working expenses of the whole process with equipments could be around:

Equipment Operating Cost	
Item	Cost in ₹
Gas cost	1100
Electricity cost	60
disposal	190
Total	1350

Maintenance Costs: Ignoring all outflows and all factory repairs, FT111 incinerator service and disposal facility may be between the range of R112000 per 12 months, i.e. ₹ one hundred and twenty depending on combustion.

Resistant bricks will always need alternatives due to heat shock and chemical erosion. A complete reheating of a heat exchanger is currently cost within the ₹ 240000 area and may be required every five years, requiring a double fire switch several times. We can advise on a comprehensive consolidation agreement for a period of 12 months to facilitate budget planning and resource maintenance.

9.4 Premises Costs

The renovation expenses of a brand new constructing ought to be less through distinctive feature of correct layout, managed creation and deliberate renovation. In my opinion, excessive renovation expenses are the end result of bad layout. As in any constructing, it's far important that enough idea has long past into the roof .

.At the cremator in Wrexham, the flat roof demanded permanent repairs and the roof of the cathedral had to be replaced 30 years later because of poor roof design and the use of a composite feel to construct a low-cost roof. At Harwood Park, today's most important heating system has not been safely heated and ventilated in the church building as it overheats different areas: this is in my view due to an unfamiliar structure. This could be an opportunity to use a renewable energy system to install the remaining gas to heat the building. The best heat application is for a period of months when the body temperature is very high. While this feature may increase the cost of capital, it can provide good investment and comply with India's Environment regulations.

I raise different meters to properly reflect the cremation and heating equipment. Careful planning for reasons will allow for strong adjustments. Regions used for memorials should be kept to a minimum. This is a good proof of customer care and in addition encourages the sale of a souvenir.

9.5 Expenditure Summary

Operating costs of per cremation of the crematorium on every thousand cremations per year would be as followed:

Expenditure Summary	
Item	Cost in ₹
human	1150
Cremator function	1340
Maintenance	110
Total	2600

9.6 Crematorium Income

money is widely available as the cost of cremation. There is a change within the nature of the provision and the costs incurred for those services. A latest crematorium in India that eliminates 1,000 cremations in 12 months may need to rely on an annually income of ₹ 2600000 from the ₹ 2600 payment according to cremation. many crematoriums are charged extra for cremation taking place outside , in the same way as the mass burial government imposes a better burial fee. This machine is not rented in the form of non-public places and in my party not to promote funerals outside of the neighborhood. This is self-inflicted as there is an ongoing cost to the operation of the crematorium and with the increase in the number of cremations increases the ability to make money and make a profit. The benefits of cremation are remarkably similar to those of crematoria. every cremation represents the potential for more income through the memorial such as the ee-e memory book, tablet tablet, ashes, non-public gardens, tree, and columbaria.

Reminder benefits cannot be adjusted. The rules governing the sale of souvenirs in the form of local government in England were amended by the dates specified in terms of the Local Government Act of 2003. The most important way is that the local government will not be able to make money legally through the sale of monuments. , whether in a cemetery. the cost of providing a memorial to India's new crematorium may include large donations and operating costs for the facility. In my opinion, the Council may be able to promote the monuments at a better cost than the exact amount of the monument. local authority can contact a non-public sector to provide interest reminders on its behalf. Now I have no idea of the procedure followed at a crematorium in the UK. In terms of choice, memorial money is much easier probably from funerals where crematoria are dumped in a

crematorium in the Memorial Garden. People who choose to dispose of cremation sites will not look at the benefits of receiving a monument at a crematorium.

10. CONCLUSION

- during cremation is a longtime Hindu rites practiced considering that historic instances and the Hindu faith allows the cremation of the useless frame during day, there's lots scope of sun crematorium on this ritual; as sun strength is likewise to be had in day-time best.
- India is dealing with the dual issues of rapid depletion of traditional fuels and environmental degradation. There is an pressing want to lessen dependence on petroleum and different traditional fuels for higher financial system and environment. Utilization of sun electricity can cope with each those issues. photovoltaic modules and panels , which converts the daylight into energy Between five hundred and six hundred kg of wooden are required to cremate a useless frame. So we're extensively resulting to worldwide global warming and pollution and forests are declining day with the aid of using day. The maximum sustainable electricity supply is daylight that too is completely inexhaustible and to be had freed from cost. It mitigates all of the above problems.
- India is located in a excessive sun insolation belt with approximately three hundred clean sunny days in a yr and the each day common sun electricity coming over India varies from four to seven kWh/m2. All those are a super aggregate for the use of sun strength in India, thus a sun crematorium could be a feasible method.
- We need to in no way advocate the use of sun photo-voltaic panels to reap the sort of massive quantity of warmth for cremation, because the daylight has little or no part, best 20% of its electricity as lighting fixtures impact and a massive part of 80% as thermal impact. So electricity from sun radiation may be applied extra in sun thermal strength technology than in sun photo-voltaic (which makes use of best the lighting fixtures impact of daylight) strength.
- Building a sun crematorium could be very expensive, considering that a sun reflector expenses a high-quality quantity of cash. But in sun cremation, considering that we need not ought to pay for fuels, because in traditional cremation, massive quantities of energy are required. So cash may be stored withinside the lengthy run.

- Central and kingdom governments have numerous guidelines which sell the use of sun strength with the aid of using offering diverse subsidies, incentives and loans.
- price of cremating a body sun crematorium is a completely great ₹2610 on the premise of a thousand cremations in line with yr, even though it do not include land cost and other charges.
- 801°C it has a low end-to-end temp, so this process can be extra time consuming and adopting this process can be difficult for households and users. So in order to achieve the maximum temperature, there is a need to add subjects within the topic of high technology for designing display and new rooms. Universities may be contacted for the purpose of assisting college students in need of solar panels.
- we can surely capable of cremate a body thru a sun crematorium constructed with a properly designed scheffler reflector and a green burning chamber.

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