

Quick Introduction about Using Blockchain with Char-making TLUD Stoves

**The CharTrac™ System is for
Higher Standards for Transparency and
Trust in Carbon Accounting**

www.CharTrac.com

ETHOS Conference - 2019

CharTrac™

by Juntos NFP

Higher Standards for Transparency and Trust in Carbon Accounting

CharTrac

LEVERAGING TECHNOLOGY FOR HIGHER STANDARDS

Cryptography, Digital Signatures and Certificates, Blockchain (Distributed Ledger) Technology

IMMUTABLE AND TRANSPARENT AUDIT TRAIL

CharTrac implements a restricted-access private blockchain that is pegged to a public blockchain (Ethereum).

CharTrac

CharTrac

DIGITALLY-SIGNED DATA STREAMS

Partner-validated operations data are securely streamed and encoded to the blockchain as that data is available (often daily).

CARBON OFFSETS WITH TRUSTED DATA PROVENANCE

CharTrac raises the bar for carbon accounting standards that relate to data provenance, transparency, and trust.

CharTrac

CharTrac™

Higher Standards for Transparency and Trust in Carbon Accounting

CharTrac builds data provenance for carbon offsets by securely and immutably documenting stakeholders, processes, assets, measurements, and transactions that define, create, or influence data of origin and historical record for project-enabled reductions of CO₂e from otherwise normal processes (such as cooking or incense stick production).

At the implementation level, CharTrac is a blockchain-enabled system that securely records project parameters and digitally encoded assets from Juntos NFP and its implementation partners, and captures streams of digitally-signed operations data from in-field operations partners.

A key component of the system is the private blockchain (restricted access), which is pegged to a public blockchain (Ethereum). It is important to note that CharTrac's blockchain (a distributed ledger technology) is not utilized for tokenizing and tracking carbon credits (offsets) as crypto tokens for market trade. Instead, the CharTrac blockchain is used to solve data provenance and accounting issues related to carbon offsets.

By capturing streams of digitally-signed data that quantify time-interval charcoal yields, weekly bulk charcoal transfers to incense makers, and other measurable components, the CharTrac system provides an immutable and transparent audit trail (data provenance) for every carbon offset generated by Juntos NFP projects.

CharTrac™ Principals

Ownership and Coordination

Juntos Energy Solutions NFP

Paul S. Anderson, PhD (Executive Director) — psanders@ilstu.edu

(Note: Investment partners are welcome. Please contact Dr. Anderson)

Field Implementation

Moulindu Banerjee (Sapient Infotech) — sapientinfo1970@gmail.com

Technical Design, Development and Administration

James S. Schoner (Software Engineer / BitMaxim) — jss@bitmaxim.com

CharTrac™ Data Entry Workbook (Example from India (left side))

- Workbook allows offline data entry by remote implementation partners.
- Digitally signed and submitted online via the CharTrac.com website.

Hingalganj 500 Stove Distribution Contract Data												Data Collection Workbook Form DCW-1000, Rev. 1.2		
Project Identifier: Hingalganj 500			Stove Type: Champion TLUD-ND			Destination Type: Residential			Stoves Placed per Contract: 1					
Enter Contract Data														
Office Use Code	Stove ID	Field Assistant				Placement Type	Replaced Stove ID	Date of Placement (Distribution)	Beneficiary / Stove Recipient				Residence Size	Region
		ID	First Name	Middle Name	Last Name				First Name	Middle Name	Last Name	Alternative Name		
H500R08S358	J52	5	Azhar	Uddin	Mondal	First TLUD		16/08/2018	[Redacted]				4	HLG
H500R08S359	J71	5	Azhar	Uddin	Mondal	First TLUD		01/09/2018	[Redacted]		Bibi	Jal...	4	HLG
H500R08S360	J114	5	Azhar	Uddin	Mondal	First TLUD		22/08/2018	[Redacted]		Bibi	Casul	4	HLG
H500R08S361	J153	5	Azhar	Uddin	Mondal	First TLUD		02/09/2018	[Redacted]		Bibi	lefa	4	HLG
H500R08S362	J54	5	Azhar	Uddin	Mondal	First TLUD		18/08/2018	[Redacted]		Bibi	Abul	4	HLG
H500R08S363	J352	2	Ayub	Ali	Mondal	First TLUD		29/08/2018	[Redacted]		Bibi	Je	4	HLG
H500R08S364	J338	2	Ayub	Ali	Mondal	First TLUD		03/08/2018	[Redacted]		Bibi	Chait	6	HLG
H500R08S365	J330	2	Ayub	Ali	Mondal	First TLUD		31/08/2018	[Redacted]		Bibi	Abul Hakim	4	HLG
H500R08S366	J275	2	Ayub	Ali	Mondal	First TLUD		24/08/2018	[Redacted]		Bibi	Abul Bari	6	HLG
H500R08S367	J343	2	Ayub	Ali	Mondal	First TLUD		19/08/2018	[Redacted]		Bibi	Fahim	3	HLG
H500R08S368	J294	2	Ayub	Ali	Mondal	First TLUD		31/08/2018	[Redacted]		Bibi	Manu	4	HLG
H500R08S369	J348	2	Ayub	Ali	Mondal	First TLUD		21/08/2018	[Redacted]		Bibi	Chait	5	HLG
H500R08S370	J476	3	Jakir		Hossain	First TLUD		02/09/2018	[Redacted]		Bibi	Chait	5	HLG
H500R08S371	J401	3	Jakir		Hossain	First TLUD		24/08/2018	[Redacted]		Bibi	Takir	4	HLG
H500R08S372	J433	3	Jakir		Hossain	First TLUD		28/08/2018	[Redacted]		Bibi	Chait	4	HLG
H500R08S373	J455	3	Jakir		Hossain	First TLUD		18/08/2018	[Redacted]		Bibi	Hal	5	HLG

CharTrac™ Data Entry Workbook (Example from India (right side))

- Workbook allows offline data entry by remote implementation partners.
- Digitally signed and submitted online via the CharTrac.com website.

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Total Stoves Placed (Target):		500										
Region	Village	Address	Phone	GPS Latitude			GPS Longitude			Beneficiary Signature	Field Assistant Signature	Other Stoves (Types and Usage)
				Degrees	Minutes	Thousandths of a Minute	Degrees	Minutes	Thousandths of a Minute			
HLG	Sandalar Bil	:Kanchonpur, PS:Hingalg		22	26	0.0	88	58	0.7	Thumb/Fingerprint	Handwritten	
HLG	Sandalar Bil	:Kanchonpur, PS:Hingalg		22	26	0.2	88	58	0.7	Handwritten	Handwritten	
HLG	Sandalar Bil	:Kanchonpur, PS:Hingalg		22	29	0.2	88	58	0.7	Handwritten	Handwritten	
HLG	Sandalar Bil	:Kanchonpur, PS:Hingalg		22	26	0.7	88	58	0.5	Handwritten	Handwritten	
HLG	Sandalar Bil	:Kanchonpur, PS:Hingalg		22	26	0.5	88	58	0.4	Handwritten	Handwritten	
HLG	Bankra	PO:Bankra, PS: Hingalgan		22	26	0.4	88	59	2.6	Thumb/Fingerprint	Handwritten	
HLG	3 no. Sandalar B	:Kanchonpur, PS: Hingalg		22	27	0.4	88	58	6.7	Thumb/Fingerprint	Handwritten	
HLG	3 no. Sandalar B	:Kanchonpur, PS: Hingalg		22	27	0.3	88	58	5.4	Thumb/Fingerprint	Handwritten	
HLG	3 no. Sandalar B	:Kanchonpur, PS: Hingalg		22	27	0.4	88	58	5.4	Handwritten	Handwritten	
HLG	3 no. Sandalar B	:Kanchonpur, PS: Hingalg		22	27	0.5	88	58	5.2	Thumb/Fingerprint	Handwritten	
HLG	3 no. Sandalar B	:Kanchonpur, PS: Hingalg		22	27	0.4	88	58	5.3	Handwritten	Handwritten	
HLG	3 no. Sandalar B	:Kanchonpur, PS: Hingalg		22	27	0.4	88	58	5.3	Thumb/Fingerprint	Handwritten	
HLG	Sahapur	PO+PS :Hingalganj		22	27	0.4	88	59	0.9	Thumb/Fingerprint	Handwritten	
HLG	Sahapur	PO+PS :Hingalganj		22	27	0.4	88	59	0.3	Handwritten	Handwritten	
HLG	Sahapur	PO+PS :Hingalganj		22	27	0.6	88	59	0.3	Handwritten	Handwritten	
HLG	Sahapur	PO+PS :Hingalganj		22	27	0.6	88	59	0.3	Handwritten	Handwritten	
HLG	Katakhal	O:Borunhat, PS:Hingalg		22	30	0.1	88	57	0.0	Thumb/Fingerprint	Handwritten	