Project Inspiration

- Climate change is a global challenge.

- Renewable energy now accounts for a third of global power capacity.

- Millennials will inherit more than **$50,000,000,000,000** in the coming decades.

- Total issuance of sustainable debt including green, social and sustainability bonds has surpassed **$1 trillion**.

- ESG, the incorporation of environmental, social and governance risk factors, is increasingly becoming a core part of any investment strategy.

Project Significance

What is GreenVest?

GreenVest is an impact investing App that provides users with financial information and sustainability of public traded companies.

Our investment strategy focuses are on Clean Energy, Sustainable Transport, Sustainable Food & Agriculture, Waste & Materials, and Ecosystem Service.

What does GreenVest do?

GreenVest collects and dives deep into companies' financial and greenhouse data to generate data-driven insights into companies' environmental, social and governance initiatives.

Our App can help facilitate investment process to whom are seeking both financial returns and social/environment good to bring about social change regarded as positive proponent.
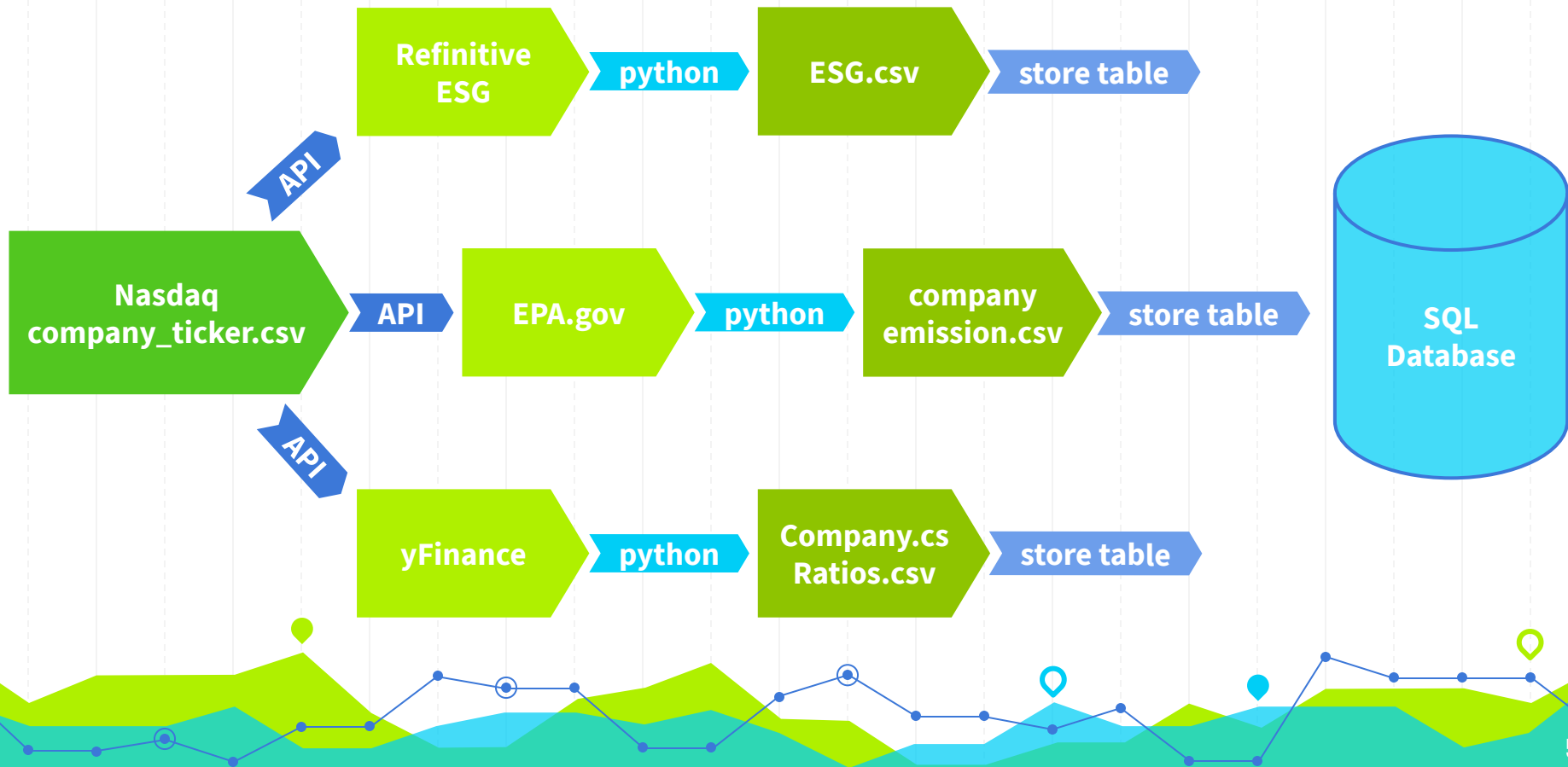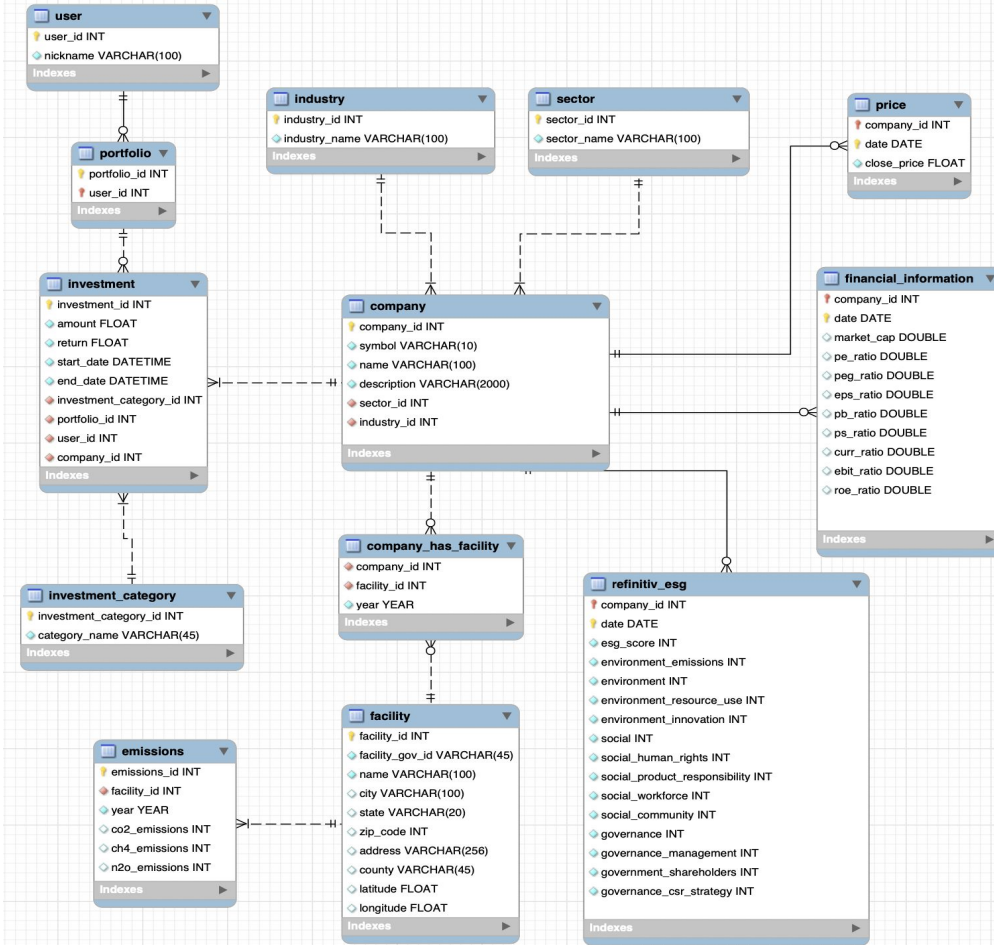
Investment Strategy Roadmap

Clean Energy

1

Sustainable
Food & Agriculture

3

Ecosystem Service

5

2

Sustainable Transport

4

Waste & Materials

6

Climate Transition
Inclusive Growth

Data Process

Refinitive ESG → python → ESG.csv → store table

Nasdaq company_ticker.csv

API

API → EPA.gov → python → company emission.csv → store table

API

yFinance → python → Company.cs Ratios.csv → store table

SQL Database

Database Design

Queries and Triggers

ESG Ranking Trigger

```
delimiter //
create trigger ESGRankingTrigger after insert on facility
for each row
begin
select RANK() OVER (
    ORDER BY esg_score DESC
    ) company_esg_ranking
    FROM
    refinitiv_esg;
end;
```

Emission Ranking Trigger

```
drop trigger if exists EmissionsRankingTrigger;
delimiter //
create trigger EmissionsRankingTrigger after insert on facility
for each row
begin
select RANK() OVER (
    ORDER BY co2_emissions + ch4_emissions + n2o_emissions DESC
    ) company_emissions_ranking
    FROM
    emissions;
end;
```

Data retrieval queries

```
-- retrieves company name, ticker, esg score
select c.name company_name, c.symbol company_symbol, esg_score
from company c inner join refinitiv_esg using company_id;
```

```
- retrieves company name, ticker, and all financial data for company
elect c.name company_name, c.symbol company_symbol, f.date, market_cap,
_ratio, peg_ratio, eps_ratio, pb_ratio, es_ratio,
curr_ratio current_ratio, ebit_ratio, roe_ratio
rom company c inner join financial_information f using company_id;
```

```
-- retrieves the company symbol, facility name, year,
-- and all three types of emissions
select c.symbol company_symbol, f.name facility_name, e.year,
 e.co2_emissions, e.ch4_emissions, e.n2o_emissions
from company c join company_has_facility chf using company_id
join facility f on f.facility_id = chf.facility_id
join emissions e on f.facility_id = e.facility_id;
```

App Building Process

1. **Backend/Data Storage (MySQL Load Data, Heroku DB for Web Access)**

2. **Data Visualization (Python Plotly + Dash)(Will Be Shown In Demo)**

3. **Host App(Hosted on Heroku, Logo Created In Illustrator)**

Load Statement

```
greenvest_app on ⅂ main [!]
❯ git add --all

greenvest_app on ⅂ main [+]
❯ git commit -m 'Finished company page'
[main 252a558] Finished company page
 1 file changed, 104 insertions(+), 104 deletions(-)

greenvest_app on ⅂ main
❯ git push heroku main_
```

Plotly | Dash

```
66        html.Div([
67            dcc.Tabs(id="tabs", value='company-tab', children=[
68                dcc.Tab(label='Company', value='company-tab',
69                    style={'font-weight': 'bold'},
70                    selected_style={'font-weight': 'bold',
71                        'color': '#1A9968',
72                        'borderTop': '2px solid #1A9968'}),
73
74                dcc.Tab(label='Industry', value='industry-tab',
75                    style={'font-weight': 'bold'},
76                    selected_style={'font-weight': 'bold',
77                        'color': '#1A9968',
78                        'borderTop': '2px solid #1A9968'}),
79
80                dcc.Tab(label='Sector', value='sector-tab',
81                    style={'font-weight': 'bold'},
82                    selected_style={'font-weight': 'bold',
83                        'color': '#1A9968',
84                        'borderTop': '2px solid #1A9968'}),
85            ], style={"padding": "25px"}),
86
```

greenvest-app
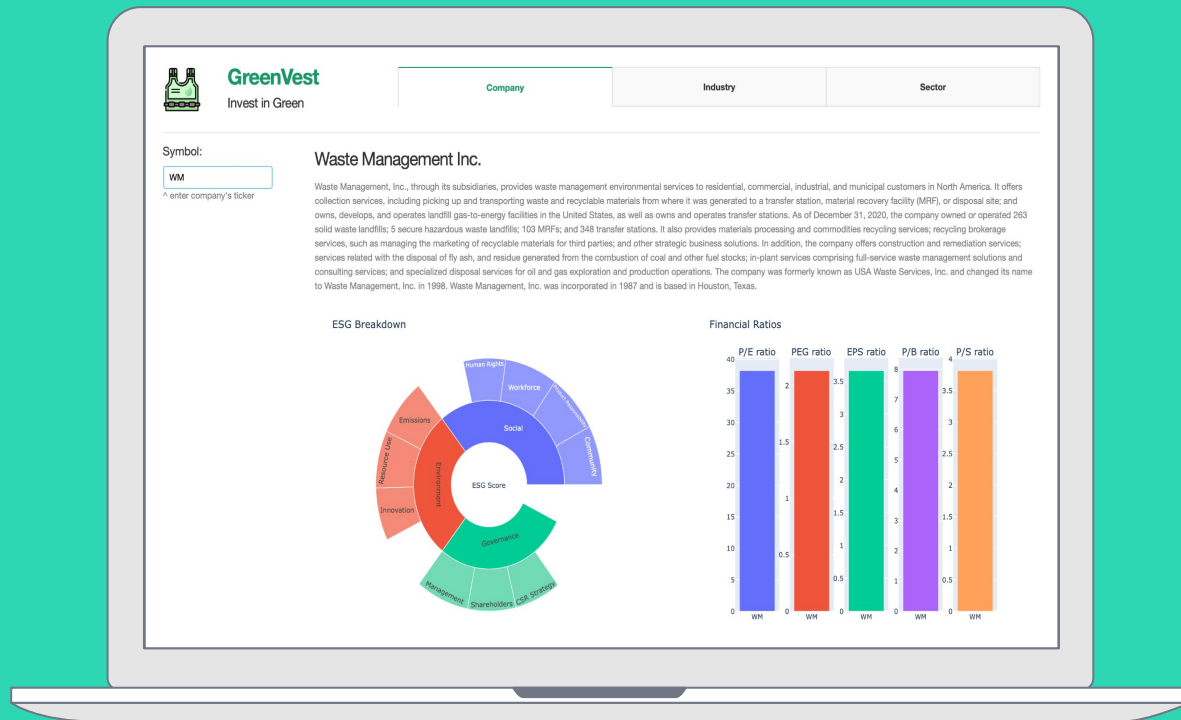
Shortcomings

Lack of Data

◉ Not able to find greenhouse emission data at company level.

◉ Data partial matching accuracy.

◉ Our data is not real time data.

◉ Most free APIs set request limits

◉ More insights into green data vs financial standing

Limitation of SQL Database

◉ Data loading process takes too much of time.

◉ NoSQL solutions might provide additional insights.

◉ Data cannot be optimized to decent levels

Next Steps

Expand Investment Category

- Bond Market
- Derivative Market

Data

- Real time data
- Gather more data, such as socioeconomic data
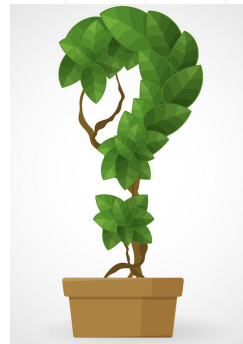
User Interface

- Implement AI for better financial advising
- Connect with banks and stock and security exchange
- Create portfolio and invest directly within our app

THANKS!

Any questions

SCAN ME

References

◉ https://www.refinitiv.com/en/sustainable-finance/esg-scores

◉ https://pypi.org/project/yfinance/

◉ https://www.epa.gov/ghgreporting/ghg-reporting-program-data-sets