Guidehouse

2021 PG Study – Low Income Sector Workplan

Guidehouse

November 23, 2020

Conference Call Etiquette During Q&A Sessions

- We know everyone is working from home, background noise if you are speaking is inevitable.
- BUT please mute yourself when you aren't speaking.
- Please do not place the line on hold.
- We are actively monitoring the chat window; consider submitting questions/comments via chat.

Webex Participant Guide

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Video On or Off

Click to see the participants

Click to see the chat and enter questions

If your **video is on**, you will see this box appear showing the video feed.

Gray means "on" (Not Muted, Sharing Video)

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Link to: Cisco Webex Participant Guide

CPUC LI Potential Study Team

- **Jason Symonds**, ESA Team
- **Kapil Kulkarni**, ESA Team
- **Genesis Tang,** PG Study Team
- **Coby Rudolph,** PG Study Team

Objective of 2021 Low-Income Potential Study

- Improve upon previous potential modeling efforts of the Low-Income sector

- Inform the CPUC and stakeholders on energy savings potential within the Energy Savings Assistance (ESA) program and residential low income sector in years to come.

Speakers Today

Amul Sathe
Project Director
Guidehouse

Karen Maoz
Project Manager
Guidehouse

Micah Turner
LI Lead Analyst
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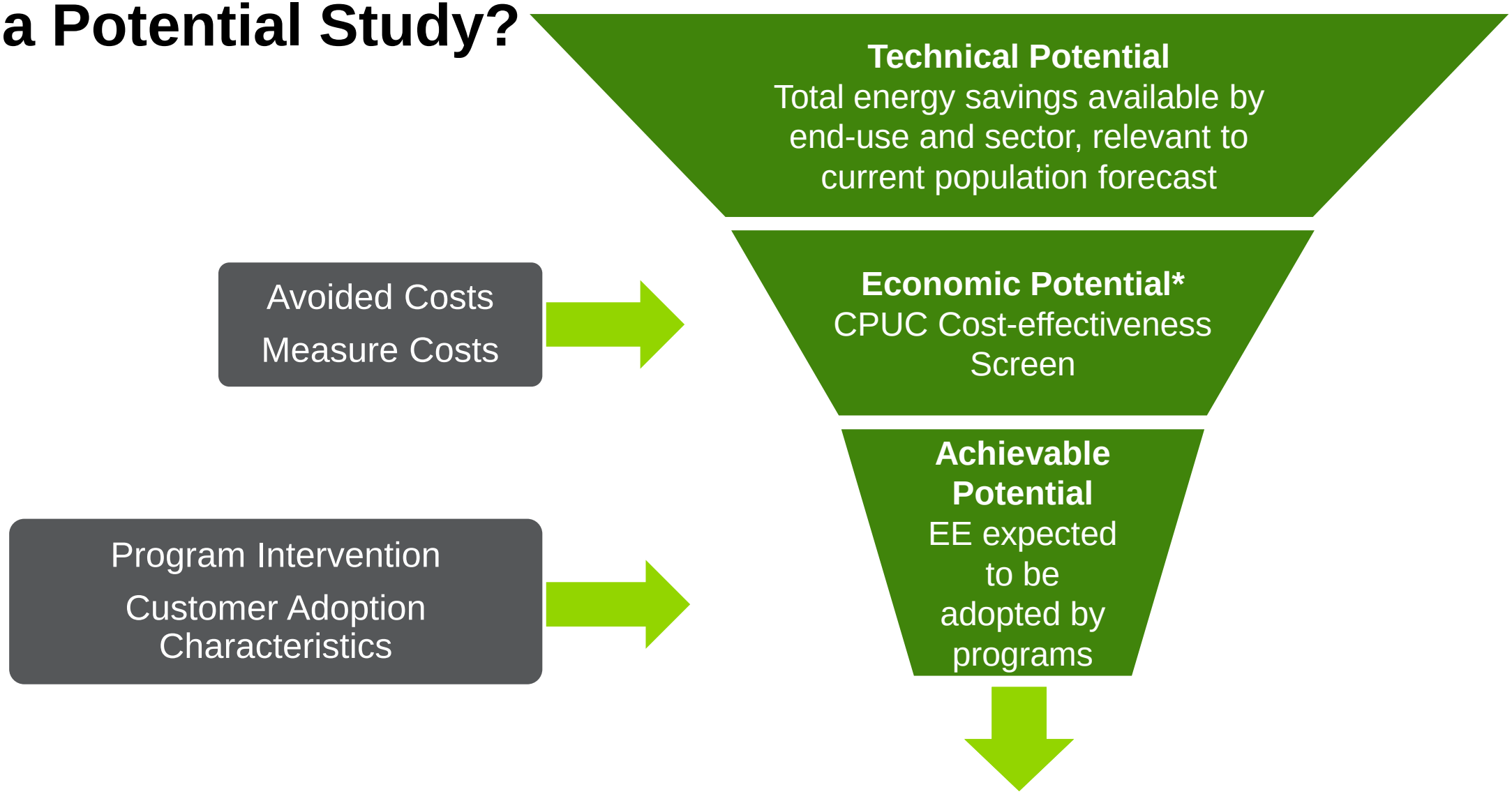
Overview of Scope

Objective	Assess the energy efficiency potential from the ESA program
Tasks	1. Measure Selection and Characterization 2. Market and Program Data Collection 3. Technical Potential Analysis 4. Achievable Potential Analysis 5. Program Budget Analysis
Deliverables	• Model file for public release • Spreadsheet database of results • Methodology and summary document

What is a Potential Study?



*Economic potential is not calculated for low income.

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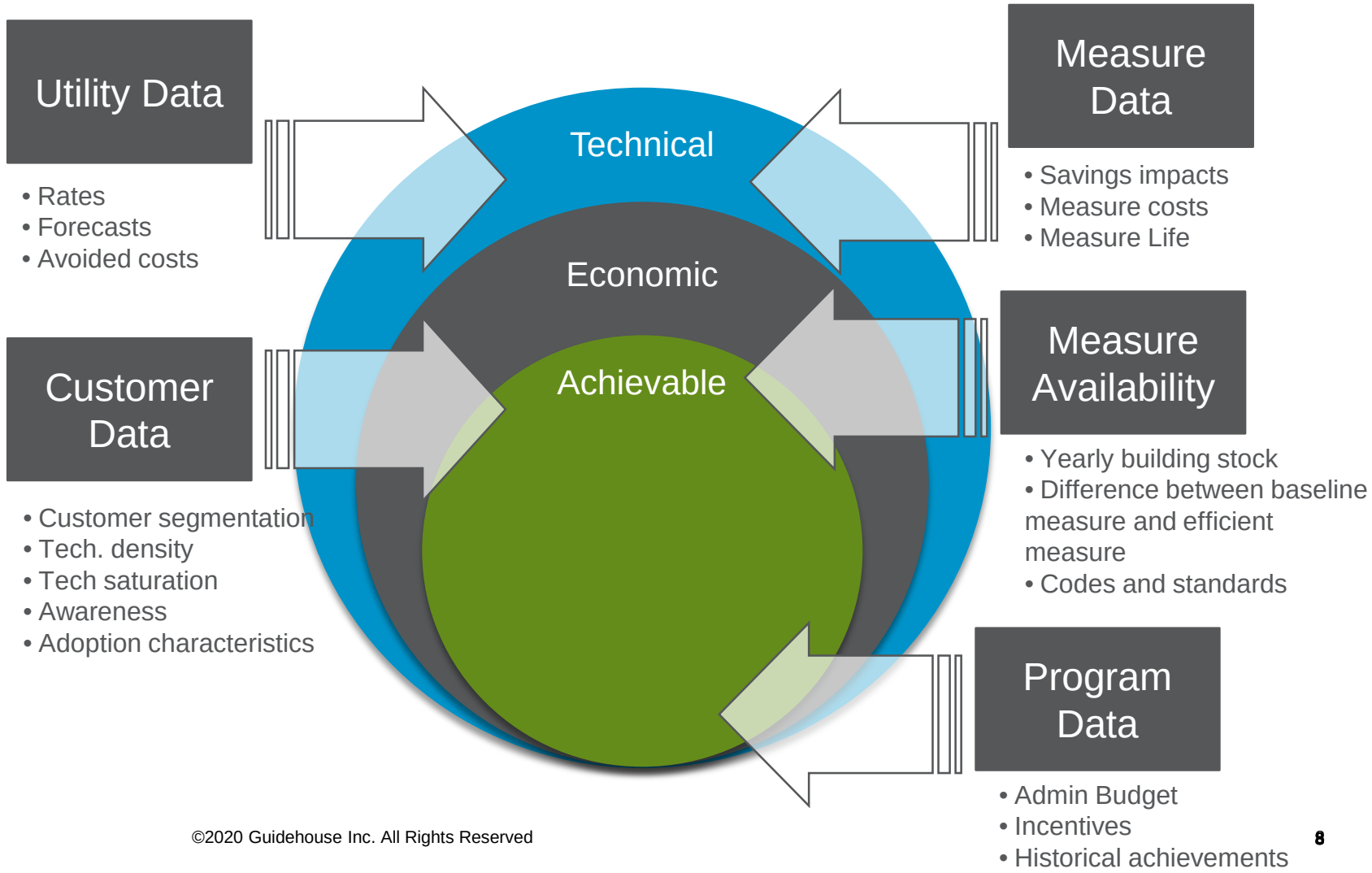
Potential Analysis Data

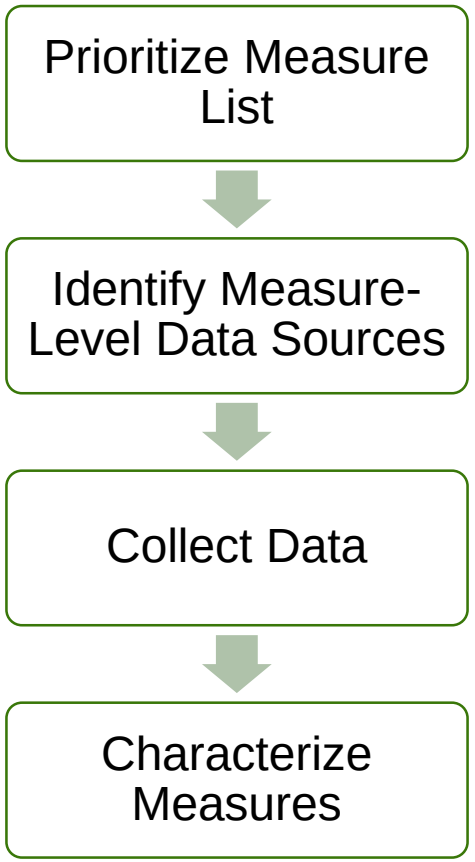
Overview

- Data rich study
  - A lot of data, but need to sift through the noise
  - Identify the good data
  - Identify the data gaps
  - Fill the data needs
  - Leverage past PG study, as appropriate
- Calculate the technical, economic, and achievable potential



Task 1: Measure Selection and Characterization

Measure Characterization Steps



- Select measures for characterization:
  - Current ESA programs
  - Proposed ESA measures in the IOU ESA/CARE applications, Staff Proposal, and Party testimony
  - Limited additional measures (e.g. cool roof)
- Characterization will take place similarly to the core PG study and will be done on the “measure group” level, rather than the measure level
  - For example: High Efficiency Clothes Washers, Central A/C Replacement

Measure Characterization Data Needs and Sources

Key Measure Characterization Data	Key Data Sources
• Electric energy, demand, and/or gas savings • Measure cost • Replacement type (replace-on-burnout, retrofit add-on, etc.) • Density (e.g. products per household) • Saturation (percentage of market that is already efficient) • Technical suitability of measure for each building type (expressed as percentage) • Measure lifetime	• 2015-2017 ESA Impact Evaluation • 2021-2026 IOU ESA Application Filings • IOU Monthly and Annual ESA Reports • Historical ESA Program Databases • Statewide ESA Policy and Procedures (P&P) Manual • Energy Consumption by Climate Zone • 2019 RASS data • DEER/State workpapers

Task 2: Market and Program Data Collection

Building Stock

- Residential IEPR demand forecast
- CEC's assumptions of demolition rate (embedded in stock)
- Climate zone-specific (at zip-code level) consumption and low income stock data
- Fraction of rented homes vs. owned homes
- Building type (SF, MF)

Measure Density* and Saturation**

Sources include:

- 2019 RASS
- Adjustments to older vintages of saturation surveys where necessary

***Density** is a measure of the number of units per building (e.g. # of lamps per household).
****Saturation** is the fraction of the density that already has the efficient technology installed and thus is not a target for the ESA program to replace.

Past ESA Program Activity

- Up to 10 years of past ESA program activity from IOUs.
- Individual measure data will include:
  - Total equipment costs
  - Total non-equipment costs (including implementation costs)
  - Number of installations
  - Energy impact (kWh, kW, Therms)

Task 3: Technical Potential Analysis

Technical Potential is the amount of energy savings that would be possible if the highest level of efficiency for all technically applicable opportunities to improve energy efficiency were taken

$$\textbf{Technical Potential} = \text{Existing Building Stock}_{\text{year}}\ (\text{homes}) * \text{Measure Density}\left(\frac{\text{widgets}}{\text{home}}\right)$$

$$* (1 - \text{Efficient Technology Saturation}) * \text{Unit Energy Impact}_{\text{year}}\left(\frac{\text{energy}}{\text{widget}}\right) * \text{Technical Suitability}$$

- Conduct analysis at the following level of granularity:
  - Utility
  - Building type
  - Measure
- Post process to further disaggregate the data by climate zones and ownership types

Task 4: Achievable Potential Analysis

Guidehouse will use a stock turnover-based model using project determined adoption curves that considers both the technology EUL & ESA program guidelines.

- Develop 3-5 prototypical adoption curves
  - Determine curves independent of building type, ownership, and climate zone
  - Use past ESA program measures' average rates of adoption and professional judgment
- Map measures to appropriate curves by:
  - Ease of implementation
  - Aesthetics
  - Require landlord approval
  - Intrusiveness
  - Historic program uptake
- Calculate achievable potential to identical granularity as Technical Potential
- Post-process results to account for building type, ownership and climate zone allocation

Guidehouse proposes up to **two additional adoption scenarios** developed with CPUC staff

Task 5: Program Budget Analysis

Program budgets will be broken down into two components each with separate estimates for each achievable potential scenario.

Equipment Expenses
Annual technology adoptions X Deemed equipment expenses

Program Costs
The forecast of program costs can be conducted in one of two ways: • Assume all program costs scale proportionally with equipment costs – Based on scaling ratios from historic program years • Assume a portion of the program costs are fixed while the remainder scales proportionally with equipment costs *Costs include implementation, training, inspections, marketing, education, EM&V, compliance, administration, and the CPUC Energy Division.*

Stakeholder Input

- Are there other **data sources** that will help us better understand building stock, density and saturation?
- What additional **energy efficiency measures**, outside of historical ESA measures or those proposed in the IOU ESA applications, do you propose this study analyze?
- What **scenarios** do you want to see in the achievable potential analysis?
- Do you have other considerations for prototypical **adoption curves** other than historical program data and professional judgment?
- What **major barriers** do you see with modelling potential in the Low Income sector that are not addressed in this study?

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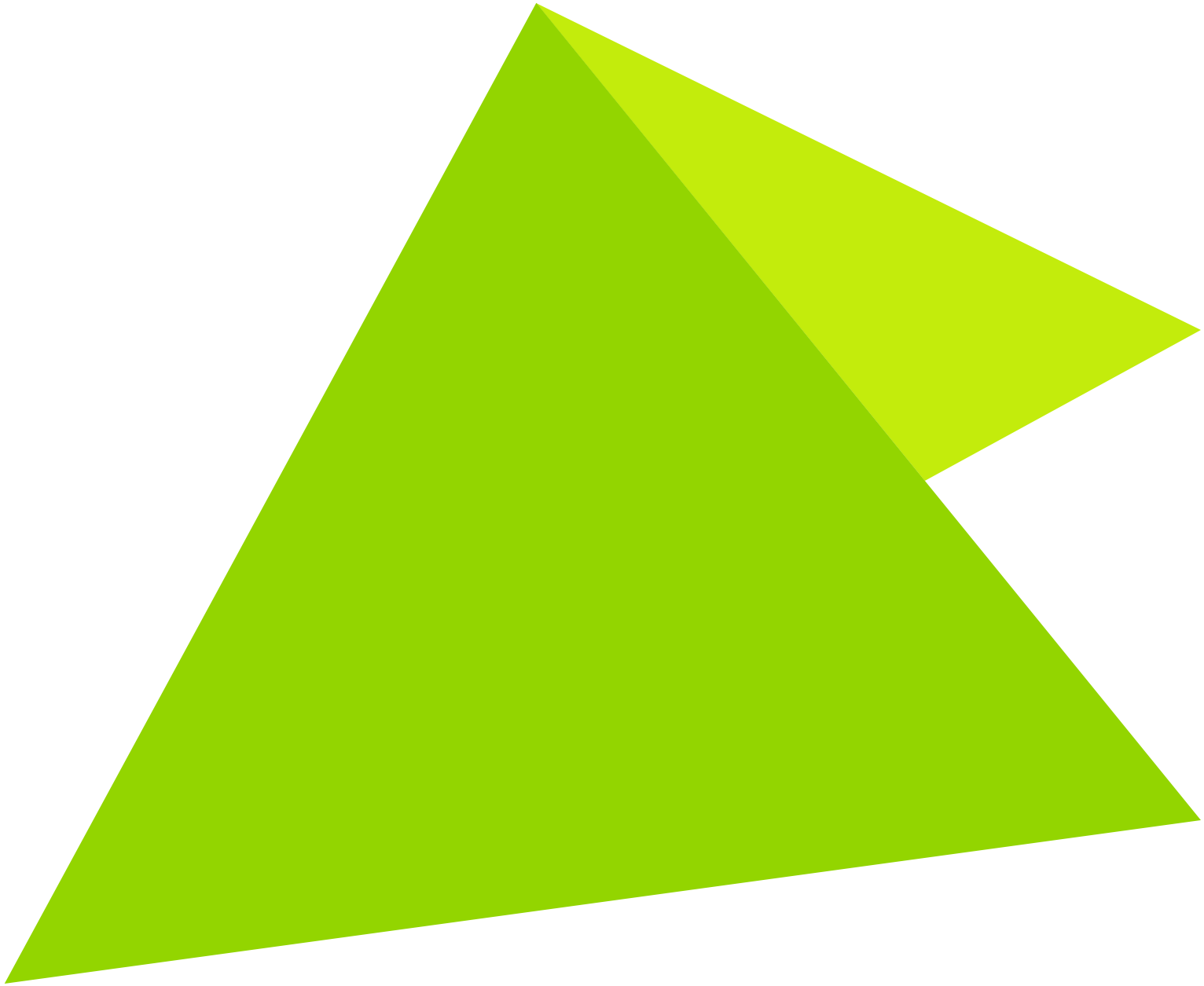

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